



SIC LASER PC USER MANUAL

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Chapter1 Introduction

1.1 LASER PC Brief Introduction

1.1.1 Software Installation

The SIC- LASER PC software runs on an PC with 900 MHz CPU and 256 MB RAM at least. In general, we recommend the fastest PC available. SIC- LASER PC was developed in Microsoft Windows XP and will run in Windows VISTA and Seven

The installation of SIC- LASER PC is very easy. Users simply need to copy SIC- LASER PC folder that is in the Install CD to hard disk, and then double click on the SIC- LASER PC.exe under the SIC- LASER PC's directory to run the software.

SIC- LASER PC requires a software security device sometimes known as a 'dongle'. This device plugs into the USB port on the PC. If there is no dongle or if the dongle is not installed correctly, a caution will appear and the software will work at demo state. In demo state, we can evaluate the software but cannot save files and control laser device.

1.1.2 Driver installation:

You must install Drivers for the Dongle and the card.

Dongle : (Don't connect dongle on USB port)

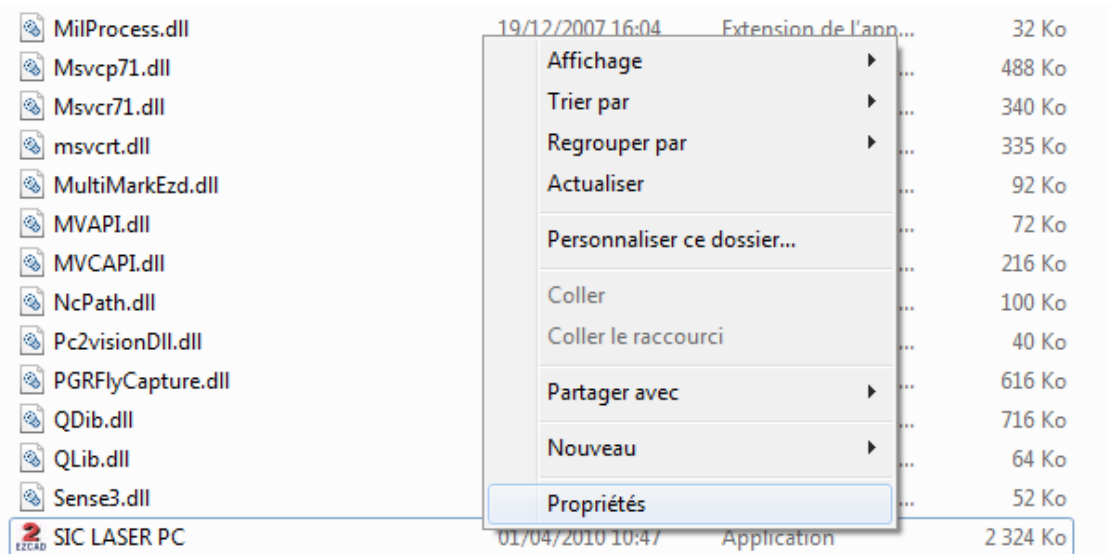
Run application C:\SIC_MARKING\SIC LASER PC\Driver\DogInstall_EN.exe.

Insert Dongle and choose directory C:\SIC_MARKING\SIC LASER PC\Driver\

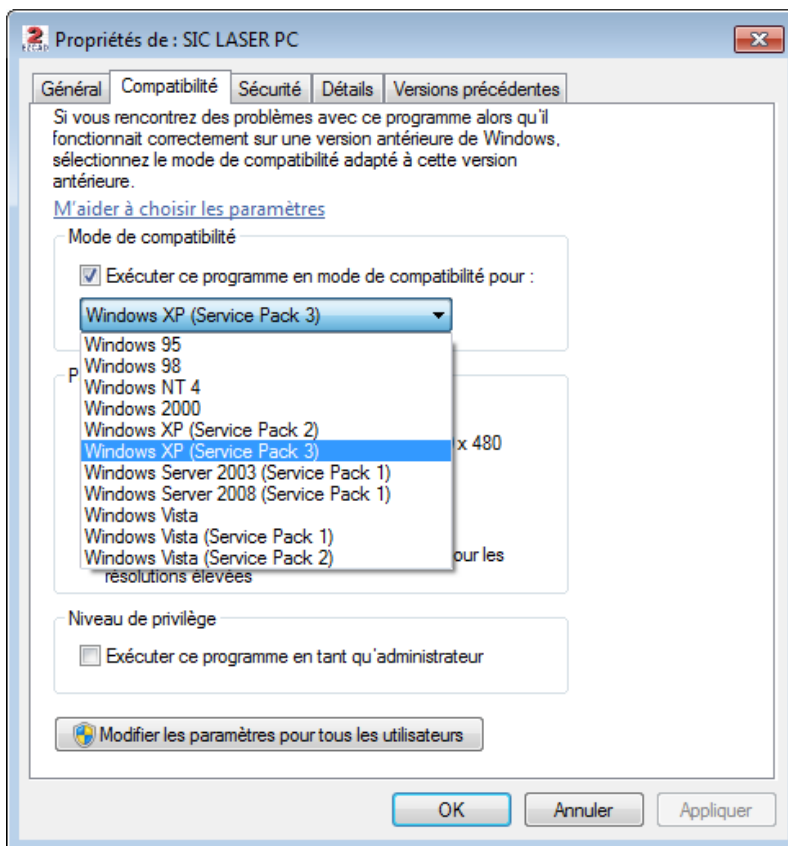
Connect Laser on USB port and choose directory C:\SIC_MARKING\SIC LASER PC\Driver\

1.1.3 Compatibility with Windows 7:

- 1 Find SIC LASER PC.EXE (Installation directory)
- 2 Select File *SIC LASER PC.exe*, and modify Properties



- 3 Select *Compatibility*
- 4 Select *Exécuter ce programme en mode de compatibilité pour :*
- 5 Select *Windows XP (Service pack 3)* et click on *Appliquer*, then click on *OK*



1.1.4 Software Function

Main functions of the software:

- Design graphics freely.
- Various types of fonts are supported. Such as TrueType, SHX, JSF(Single line font defined

by SIC- LASER PC), DMF(Dot Matrix Font), One-Dimensional bar code, Two-Dimensional bar code , and so on)

- Flexible variable text: changes the text real time while in laser processing. Excel datasheet is supported.
- Can read text data directly through the serial port
- Can read text data directly through the network
- Strong node editing function make the curve modification easier
- The software can support 265 “pencils”, which used to draw graphic and can be set different processing parameters.
- Common types of images are supported. (bmp, jpg, gif, tga, png, tif...)
- Common vector images are supported. (ai, dxf, dst, plt...)
- Image processing (Grayscale, White / Black Transformations)
- Powerful hatching functions, such as support round hatch.
- An opening language supporting system makes the software easy to run in various languages.

1.1.5 Interface Introduction

- **Software starting interface**

The picture (Figure 1-1) appears while running the program, and meanwhile the initial operations takes place in the background.



Figure 1-1 SIC- LASER PC Main Interface

1.1.6 Interface Introduction

- **Main Interface (Figure 1-2)**

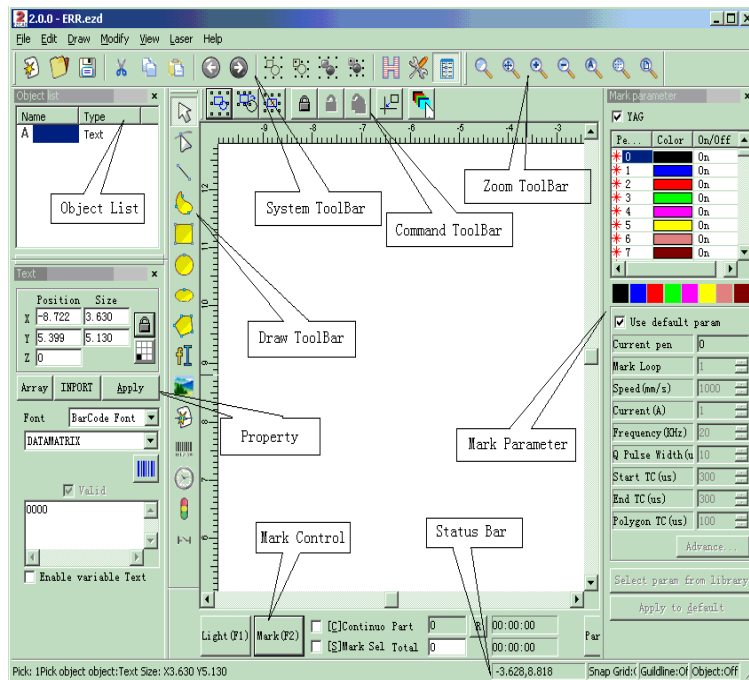


Figure 1-2 SIC- LASER PC Main Window

Chapter 2 File Menu

The File Menu is used for common file functions such as opening, saving, importing images from Twain equipment, etc. (Figure 2-1)



Figure 2-1 File Menu

2.1 New (N)

“New” is used to create a blank work space to construct objects, and its shortcut key is “Ctrl + N”¹. When “New” is clicked, the software will close the currents and create a new file. If the documents you are working on has not been saved yet, the software will prompt if you would like

to save it. The icon of “New” in toolbar is .

If you move the mouse cursor onto the icon and keep it for a while, a prompt information (Tooltip) explaining its function will appear. There also will be some detailed explanations appearing in the status bar in the bottom of the main window. If you move the mouse cursor onto “New” in File Menu only detailed explanations in the status bar will appear

Reminder: In SIC- LASER PC software, each icon in the Toolbar contains a function of showing brief prompt information and displaying detailed explanation. Also, each icon has a corresponding menu item, and both carry out the same function.

2.2 Open (O)

“Open” is used to load a saved “.ezd” file, and its shortcut key is “Ctrl + O”. (Figure 2-2) When click “Open”, the software will pop an open-file dialog to ask you to select the file you want to open (Figure 2-2). When you select a valid “.ezd” file, the dialog would display the preview of the file (you must have saved the preview when you saved the file).

¹ “Ctrl + N” refers to press the key ‘N’ while press the key ‘Ctrl’. The following contents do the same.

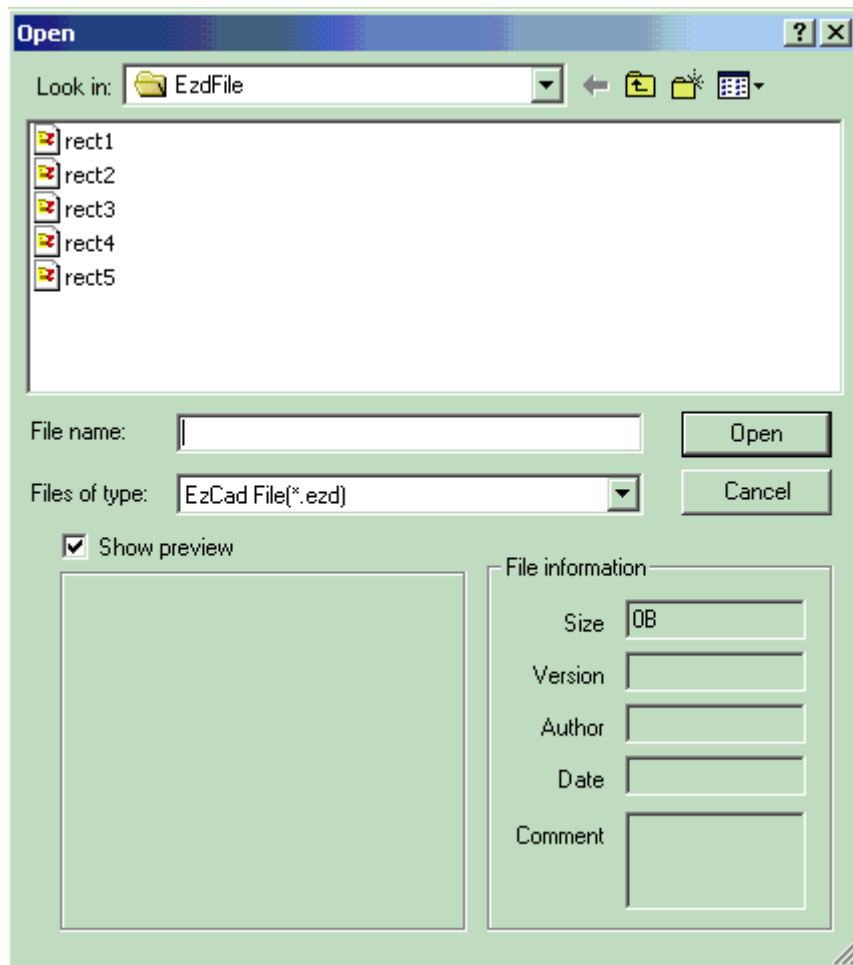


Figure 2-2 “Open” Dialog Box

The icon of “Open” in toolbar is .

The files saved in other formats than .ezd cannot be opened with the “Open” command.

2.3 Save (S) / Save As (A)

“Save” file is used to save the current state of the document on hard disk. “Save As” is used to save the current document on hard disk under another name.

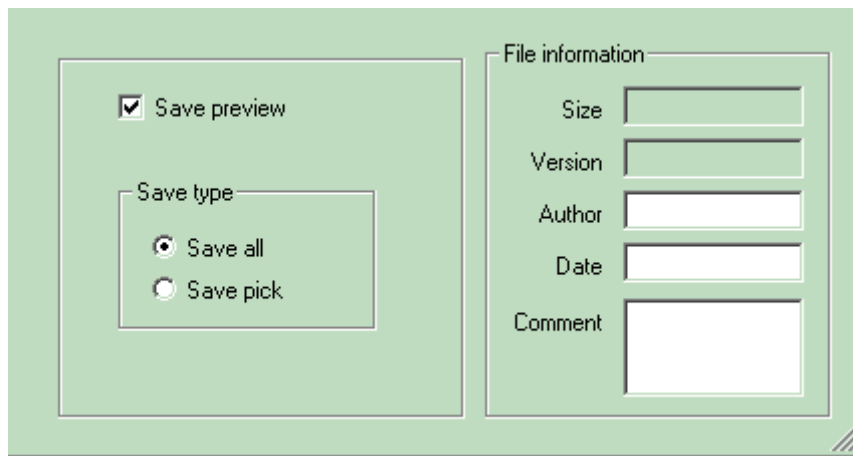


Figure 2-3 “Save” dialog box

If you select “Save Preview Image”, you will see the preview when you open the file (refer to “Open” function).

The icon of “Save” in toolbar is .

2.4 Print

“Print” is used to print the images you are working on.

2.5 Obtain Scan Images (M)

“Scan Images” is used to get digital graphic object from Twain device. When selected, the “Scan Images” function will prompt the user to choose a Twain device. (The Twain device listed in the column should be those which have been legally installed in the computer.) When the suitable device is selected, you can now insert a graphic object into the current selected document.

2.6 System Parameter (P)

“System Parameter” configures the software, and the icon of “System Parameter” in toolbar is .

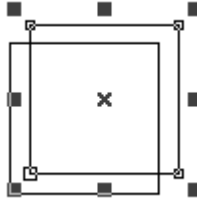
Users can use this command to change the default setting of Display, Save and Language, etc. When selected, a dialog box will appear. You can set unit, color displayed, work space’s parameter, interval of auto save, the locale language, etc.

2.6.1 General

In “General”, common parameters can be configured. (Figure 2-4)

“**Unit Type**”: millimeter and inch are two options can be selected.

“**Paste X**” and “**Paste Y**”: the relative offsets to the previous object when paste.



“**Grid**”: show or hide the grid

“**Grid Space**”: adjust the distance in grid.

“**Enable Mark Mutex (LASER PCMUTEX_MARKING)**” :This option is used to synchronize the LASER PC program with third-party programs. If checked, the LASER PC software creates a mutex object named “LASER PCMUTEX_MARKING”. The mark command cannot be executed until the mutex is “signaled” by other programs. After marking, the mutex will be switched to “nonsignaled” state by LASER PC software

“**Execute when LASER PC starts**”: The exe file appointed here will be executed when the LASER PC software starts.

“**Execute when LASER PC Finish**”: The exe file appointed here will be executed when the LASER PC software ends

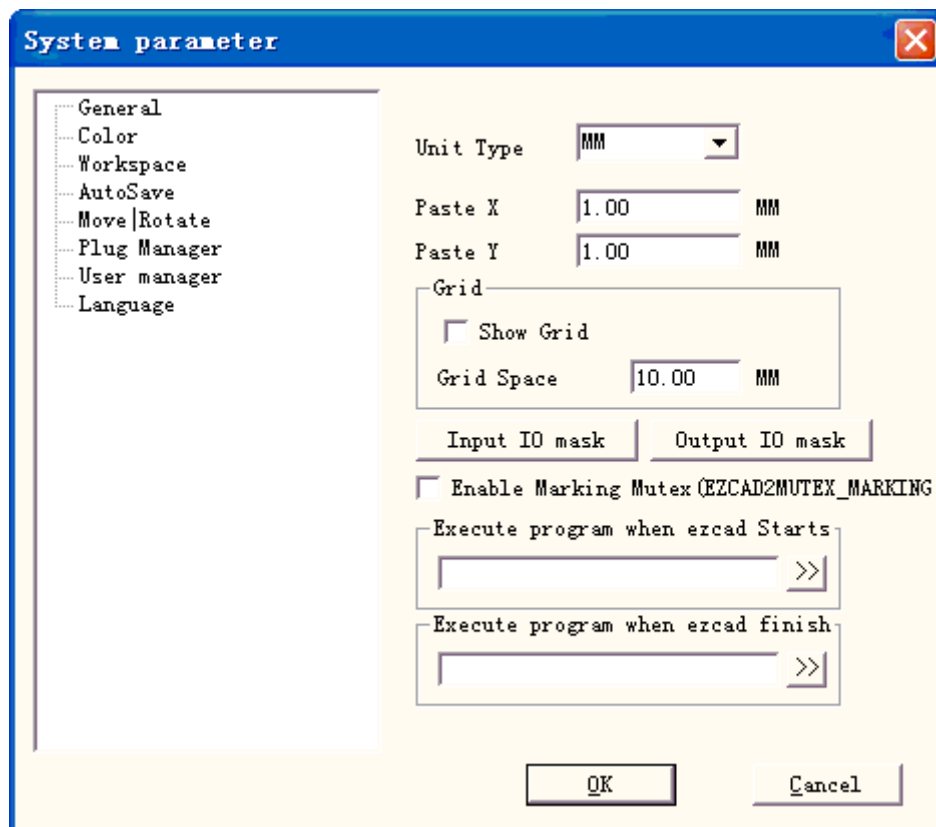


Figure 2-4 System Parameter

2.6.2 Color

“Color” is used to set the color of background, work space, guide line and grid, etc. Double click the color stripe could change the color wanted. (Figure 2-5)

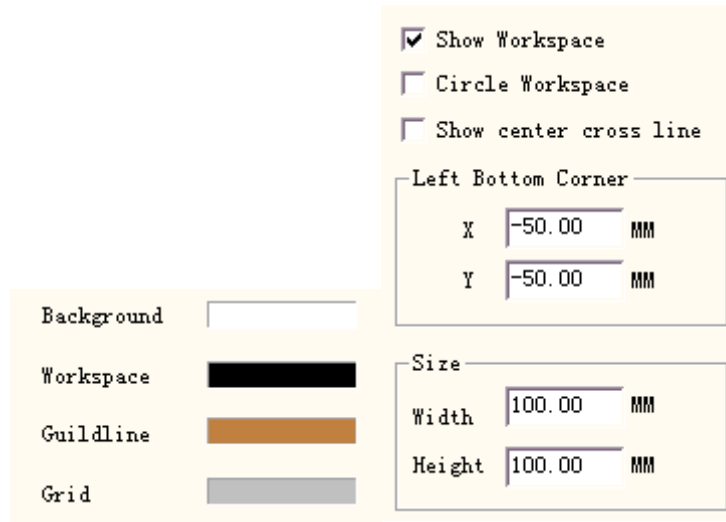


Figure 2-5 Color

Figure 2-6 Set the Work Space

2.6.3 Work Space

The set of the work space's property contains the size, type and position at the work space. (Figure 2-6)

The Work Space is the rectangle or circle area in the main interface window. This space corresponds to the laser's marking windows. Any object draws in this area will be marked in operation. Due to the limit of window, objects draw out of this space will not be marked.

2.6.4 Auto Save

“Auto Save” refers to the interval time between two automatic saves, the initial value is 10 which means the file is saved every ten minutes. The file saved is named as 'AutoSave.ezd' in SIC-LASER PC's directory. (Figure 2-7)

☒ Ever minutes, Auto save

Save current data to file
'AutoSave.Ezd' in EzCad directory
at specified time space.

Figure 2-7 Auto Save

Keyboard

Nudge Distance mm

Big Nudge scale

Rotate angle Degree

The way to go origin

7	6	5
8	0	4
1	2	3

Input point NO.

X

Y

Figure 2-8 Move-Rotate

2.6.5 Move-Rotate

See figure 2-8.

Nudge Distance: the distance the object moves when pressing direction keys.

Big Nudge Scale: the distance the object moves when pressing “shift” key and direction keys on the same time. Distance of Big Nudge Scale = Nudge Distance x Big Nudge Scale

Rotate Angle: the angle the object rotates each time when press direction keys and “ctrl” key together

Object's Origin: when use “Put to origin” function, which point of the object should be put on the origin.

2.6.6 Plug Manager

The list displays the LASER PC software plug which has already been installed in the computer. The users can activate or inactivate each plug. Press “blank” key or double click the plug name will switch the active state. (Figure 2-9) Changes will take effect in LASER PC's next start.

Plug file name	Plug s...	Plu
D:\EzCad2.0\bin\PLU...	Useable	2.0
D:\EzCad2.0\bin\PLU...	Useable	2.0

The change will be valid at next start

Figure 2-9 Plug List

2.6.7 User manager

Use to choose if users must enter a password. (Figure 2-10)

When enable “You must enter and password before using”, the system default has a administrator and a designer, the user can increase operator.

Administrator can use all software functions

Designer can revise all software function besides the user information

Draftsman can draw a file, set machine parameters but can't set user information, system parameters and machine file.

Operator can only open an existing document, cannot revise and preserve it, as well as revises the system parameter, this may prevent the operator to change the system parameters and cause dysfunction.



Figure 2-10 user manager dialog box

2.6.8 Language

This item is used to change languages between French and English.

Changes will take effect when restarting the marking software.

2.7 Recent File List

Below the menu item of **System Parameter**, a list is displayed to show the latest Document files opened, and the max amount of the file items is ten.

2.8 Exit (X)

Exit the LASER PC software. When selected the Exit function will prompt if user wants to save the files which have not been saved yet.

2.9 Object List

Object List is in the left side of the main interface window.

Marked objects are grouped into an object structure or ungrouped to many objects. (Figure 2-11)

When in marking process, system will follow the order to mark the objects listed.

Users can rearrange the list by directly dragging the object up/down or right keyboard to change the marking order. Users can double click on the object's bar to name them.

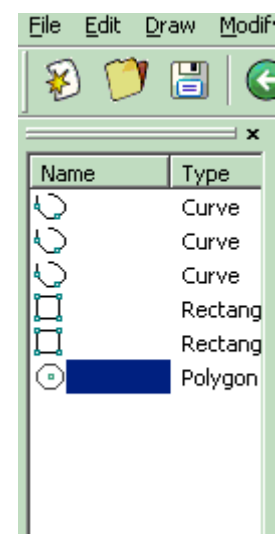


Figure 2-11 Object List

2.10 Object Properties

Object Properties are displayed in the left side of the main interface window

-  : The point of the objects which is the reference for coordinates.
- X position:** the X coordinate of the point in the left bottom corner of the object selected.
- Y position:** the Y coordinate of the point in the left bottom corner of the object selected
- Z position:** the Z coordinate of selected object
- X Size:** width of the object selected
- Y Size:** height of the object selected
-  : Lock the current width/height proportion of the object selected.
 If user changes the object's size, system will keep the X/Y ratio.
 Click the button will switch to unlock state

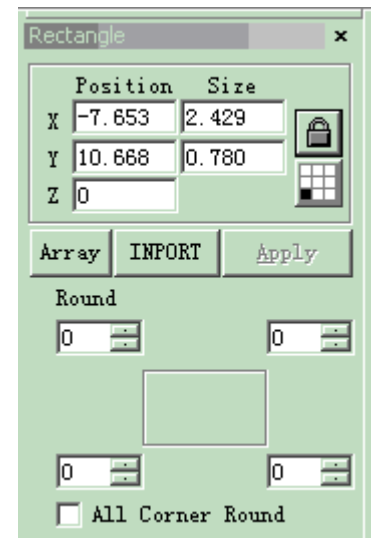


Figure 2-12 Object Property

- Array:** Copy the current object and paste in function of the number of c
Count X: the count of the row
Count Y: the count of the column
Inc (mm): the space between each row|column.
 Figure 2-13 stands for the situation when "X=2, Y=3"
 Figure 2-14 stands for the situation when "X=3, Y=2"



: set array's row as marking precedence



: set array towards vertical direction as marking precedence



: Unidirectional marking.



: Bidirectional marking

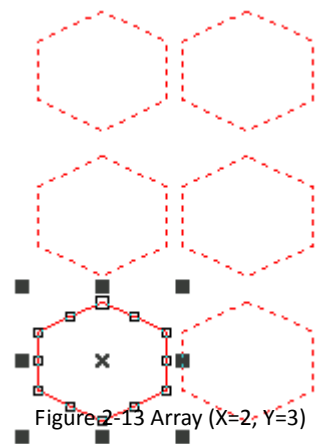


Figure 2-13 Array (X=2, Y=3)

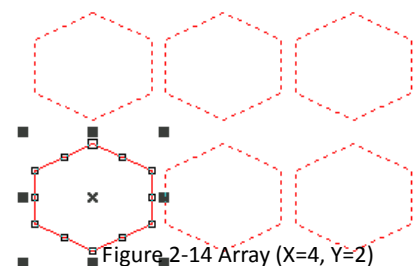


Figure 2-14 Array (X=4, Y=2)

Chapter 3 Edit Menu

“Edit Menu” carries out the editing operation of an object. (Figure 3-1)

Edit	Draw	Modify	View	Layers
Undo Pick			Ctrl+Z	
Redo			Ctrl+Y	
Cut\tCtrl+X				
Copy\tCtrl+C				
Paste\tCtrl+V				
Combine\tCtrl+L				
UnCombine\tCtrl+K				
Group\tCtrl+G				
UnGroup\tCtrl+U				
Hatch\tCtrl+H				
To Curve\tCtrl+Q				
To Dashed				
Offset				

Figure 3-1 Edit Menu

3.1 Undo (U) / Redo (R)

“Undo” will undo the last action that the user made in SIC- LASER PC. For example, if the user has deleted an object accidentally, clicking Undo will bring the program back one step when that item was still existing. The user can also select “Redo” to redo the last action which has just been deleted.

3.2 Cut (T) / Copy (C) / Paste (P)

“Cut” will delete the object selected from SIC- LASER PC and copy it to the clipboard. It can be inserted back into the .ezd file later using “Paste” function. Note that it will be lost if other data is copied to the clipboard.

“Copy” will copy the selected object to the clipboard and reserve the current object.

“Paste” will paste the object from the clipboard to current document file.

The shortcut keys of “Cut”, “Copy” and “Paste” respectively are: Ctrl+X, Ctrl+C and Ctrl+V.

3.3 Combine / Uncombine

“Combine” will ignore all the selected objects’ curve properties and combine those objects into a new curve combination with new curve properties. Same as other objects, this new combination can be selected, copied, pasted and set properties.

“Uncombine” will get the combination back to the curve objects separately. The objects after

“Uncombine” may be different from those before “Combine”. “Undo” should be used to restore the original objects

The Combine’s icon in Toolbar is , and the Uncombine’s icon in Toolbar is .
The shortcuts of “Combine” and “Uncombine” respectively are: Ctrl+L and Ctrl+K.

3.4 Group / UnGroup

“Group” will keep the selected objects’ original properties and make them into a new object, and this new group, as the same as other object, can be selected, copied, pasted and set object properties.

“Ungroup” will turn the object which has just been grouped into previous situation.

The icon of Group in Toolbar is , and UnGroup’s is .
The shortcut of “Group” and “UnGroup” respectively are: Ctrl+G and Ctrl+U.

3.5 Hatch

“Hatch” is used to fill the current objects. This object must have closed curve. If you choose many objects to fill, these figures can be objects nested mutually. Any two objects may not have intersection parts (Figure 3-2)



Figure 3-2 Hatch

(Objects on the left can be filled; The two rectangles on the right may get unexpected result for they intersect each other.)

The icon of Hatch in Toolbar is , and when selected a hatch dialog box will appear (Figure 3-3).

Mark Contour: Mark the current object’s contour or not



means when click ‘Mark Contour’, mark hatch line first then mark contour



means when click ‘Mark Contour’, mark contour first then mark hatch line

Hatch 1 / Hatch 2 / Hatch 3: Users may have three independent hatch parameters to hatch the same object. Each set of hatch can have a different Pen No. which stands for a set of marking parameters.

Enable: Select the current hatch parameter for marking.

All Calc: Calculate all the selected objects as a whole. This is an optimizing option. In some cases the speed of marking may highly be raised. It will take long time to calculate large, complex objects. When not selected, the objects will be calculated separately.

For example: draw three rectangles, line Space is 1mm, angle is 0.

1. Do not click 'All Calc', system will mark as the order of the object list, marks hatch lines in the first rectangle then in the second rectangle, and so on.
2. Click 'All Calc', mark all the hatch lines at one time, marks all the hatches that are on the same line.
3. Marking result as follow fig 3-4:

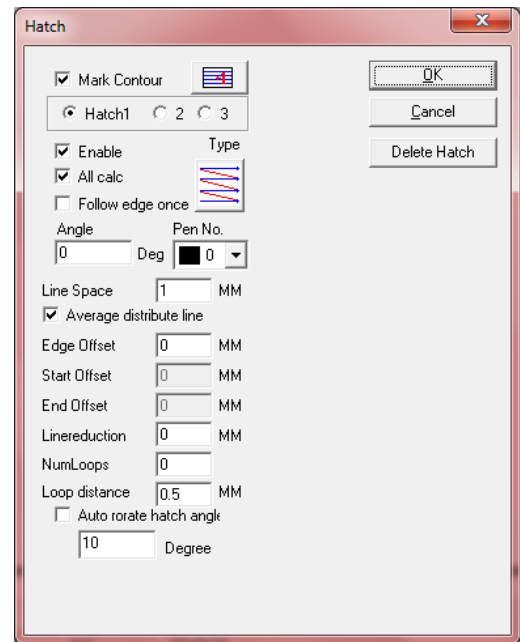


Figure 3-3 Hatch

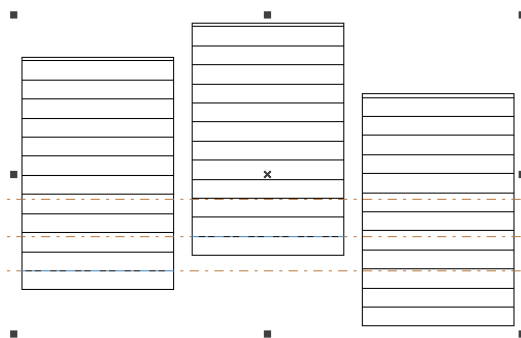


Fig 3-4(a) do not click 'All Calc', the hatch line are not in the same line

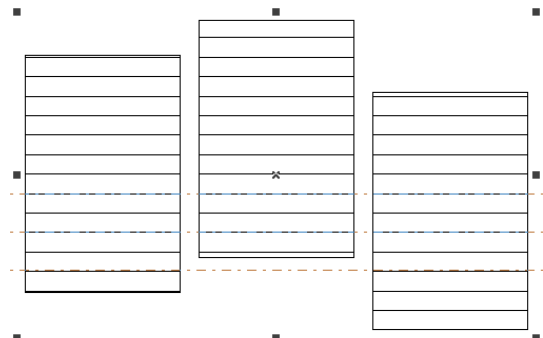


Fig 3-4(b) click 'All Calc', hatch line are in the same line

Type of Hatch



Unidirectional hatch: The hatch lines will be marked from left to right.



Bidirectional hatch: The hatch lines will be marked from left to right first, and then from right to left.



Ring-like hatch: fills objects from the outside to the inside like a ring



Continuous hatch: The hatch lines will be marked from left to right first, then from right to left continuously.

Click the button will switch between the Unidirectional, bidirectional, ring-like and continuous hatch.

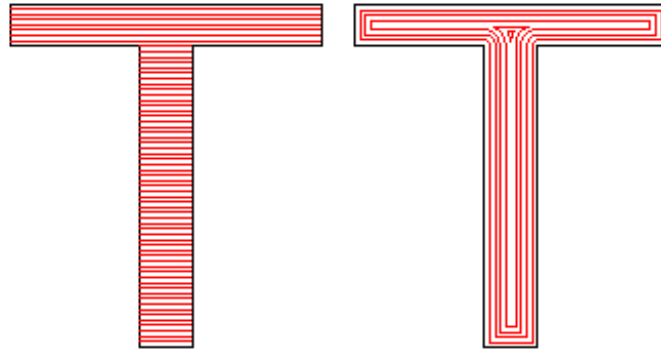


Figure 3-5 Types of hatch

(The left object is being filled with Unidirectional Hatch or Bidirectional Hatch, and the right object with Ring-like hatch)

Angle: Angle between hatch lines and X axis, (Figure 3-6)

Line Space: the space between two hatch lines

Edge offset: the distance between hatch lines and the object's outline (Figure 3-7)

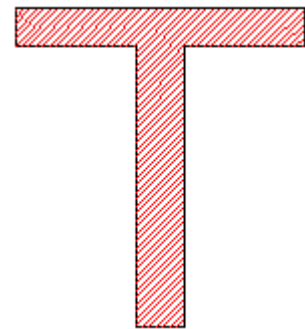


Figure 3-6 Degrees
(Angles is 45°)

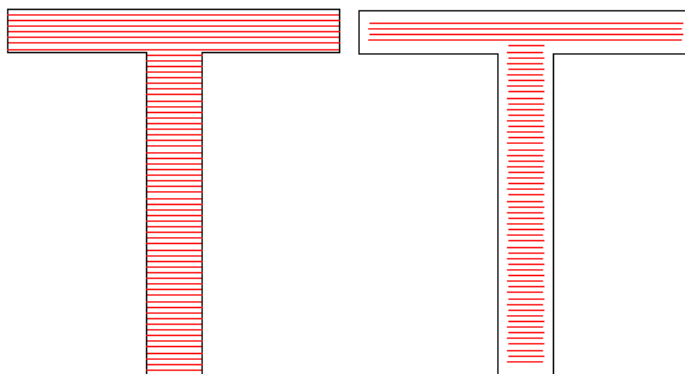


Figure 3-7 Border Distance

(The left object shows the figure when Edge offset is 0 and the right shows when it is 0.5.)

Follow edge once: draws outline one time around the hatch lines after filling (Figure 3-8)

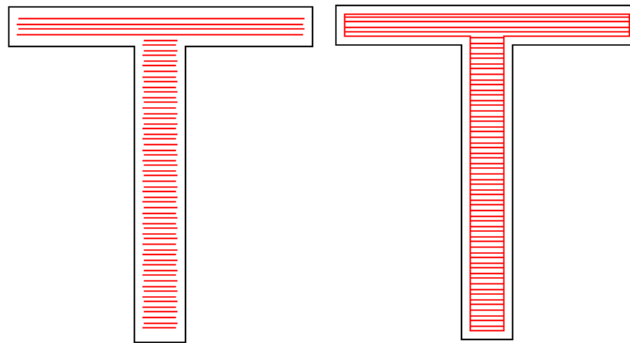


Figure 3-8 Follow edge one
(The left object doesn't enable this option and the right one does.)

Start Offset: the distance between the first hatch line and the border of the object
End Offset: the distance between the last hatch line and the border of the object

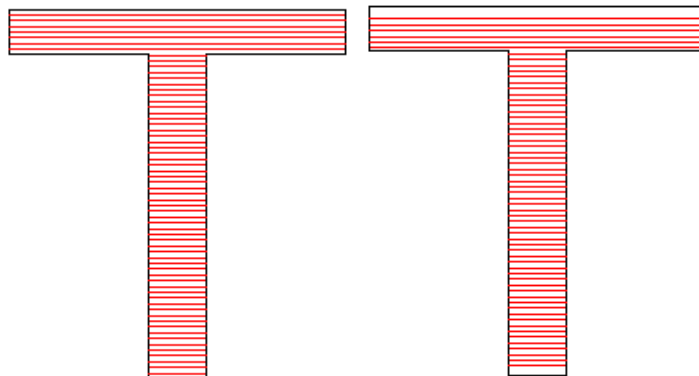


Figure 3-9 Offset Distances
(The left figure is the object when the Start offset and End Offset are 0, and the right figure is the object when the Start offset and End Offset are both 0.5.)

Average distributes line: After select this item, the software automatically adjusts the line space to distribute line between the start and the end. (Figure 3-10)

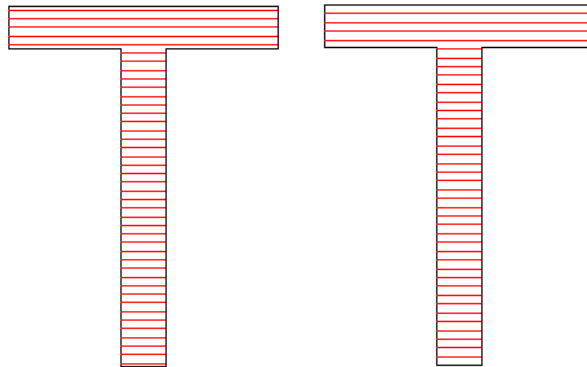


Figure 3-10 Average Distribute line
(Space line is 1mm. The left figure is the object whithout average distribute line, the right object is with average distribute line)

Linereduction: The hatch lines are reduced both sides. (Figure 3-11)

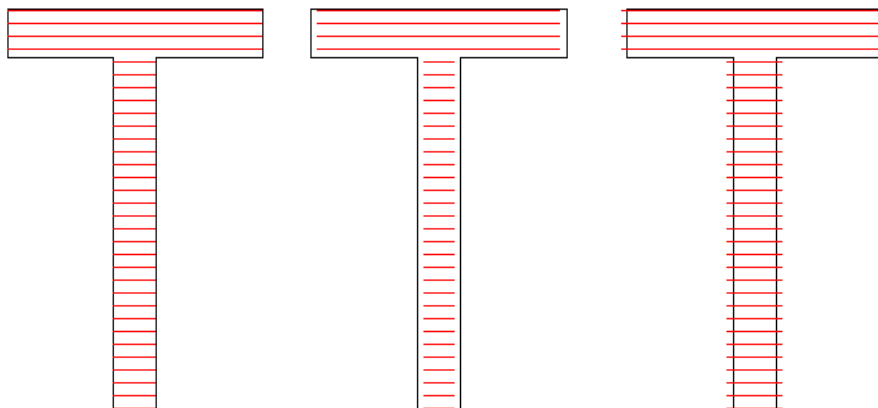


Figure 3-11 Linereduction
(The left figure is the object when the Linereduction is 0,the middle figure is the object when the Linereduction is 0.5, and the right figure is the object when the Linereduction is -0.5)

NumLoops: The times of Ring-like hatch before the acinicing hatch (Figure 3-11).

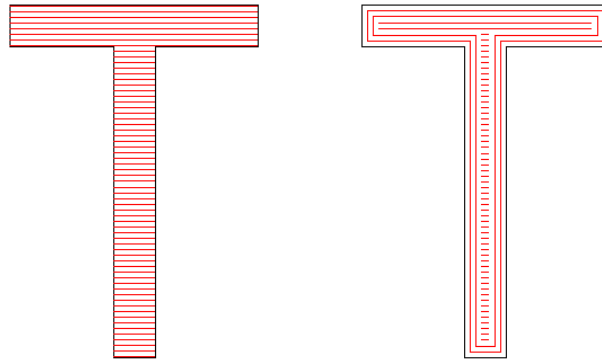


Figure 3-11 NumLoops

(The left figure is the object when the NumLoops is 0,and the right figure is the object when the NumLoops is 2)

Auto rotate hatch: If selected, hatch line angle will increase after every marking. For example, angle is 0, auto rotate angle is 30, the first mark angle is 0, the second is 30, the third is 60, and so on.

3.6 To Curve

“To Curve” turns the current selected object into curve object. Allow to more object’s points and modify its shape.

3.7 To Dashed

‘To Dashed’ turns the current selected object into dashed object, (figure 3-12)

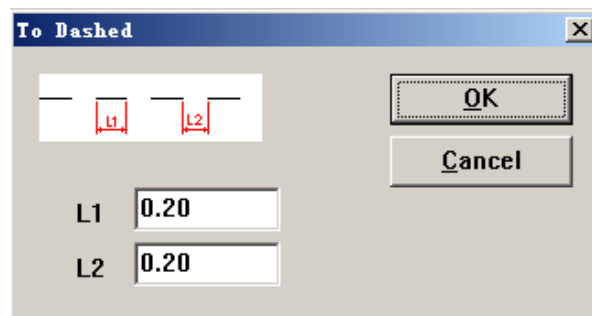


Figure 3-12 dashed object

User can set the length of the line and the distance between two lines

3.8 Offset



Offset dist: the distance between the new curve and the original object.

After defined the Offset distance, click inside the object and another one smaller will appear, click outside the object and another one bigger will move right.

Chapter 4 Draw Menu

“Draw Menu” consists of various common items for drawing, for instant, Dot, Line, Curve, Polygon, etc. Draw Menu has a Toolbar corresponding. For example, as Figure 4-1 shows, when you have selected the drawing command or the icon in Toolbar, the Present Command Toolbar on the top of the main window will be changed to show some options of the current command.

Users can use the right button of the mouse to end a drawing command.

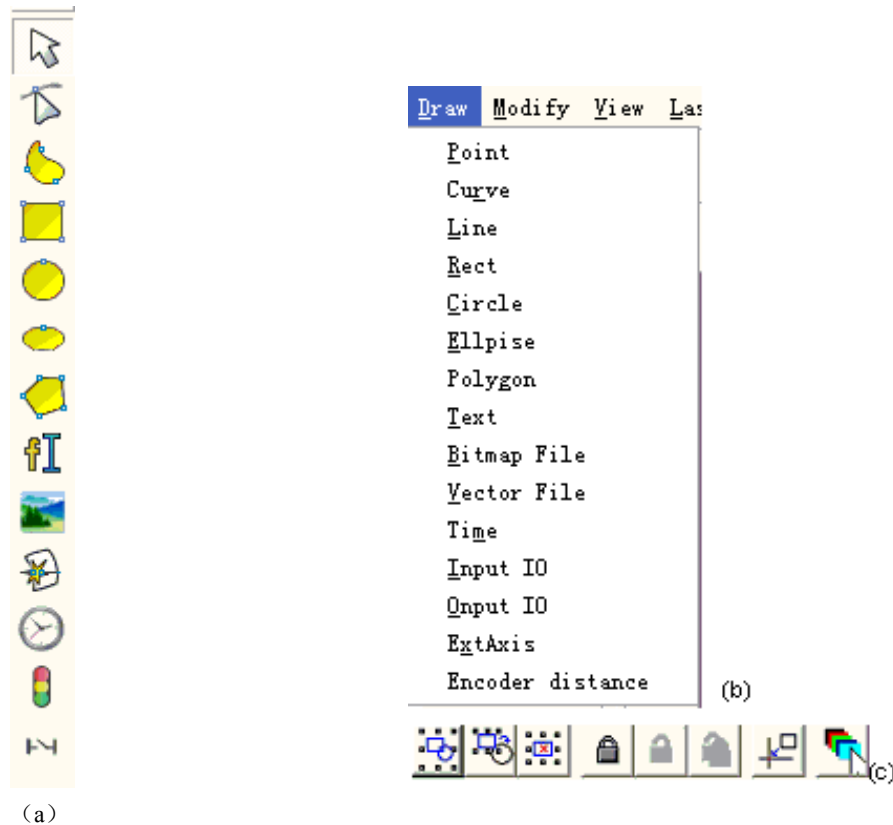


Figure 4-1 Draw Menu

(The three pictures above stand for: (a) Draw Toolbar; (b) Draw Menu; (c) Command Toolbar)

4.1 Point (D)

Draw a dot in the working space or add dots on existing curves.

4.2 Curve

To draw a curve, users can select command “Curve” in the Draw Menu

Curve’s icon in the Toolbar is . (Figure 4-2)

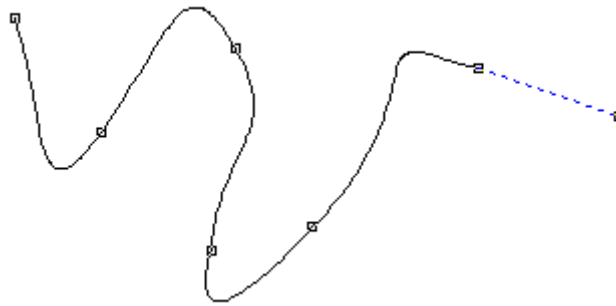


Figure 4-2 Draw a Curve

When command “Curve” selected, users can draw free curves by pressing the left button of the mouse and drag it.

When command “Curve” selected, users can move the mouse to the nodes on the middle of the curve and press the left button of the mouse to delete the current node.

When “Curve” commands selected, user can move the mouse to the node on the beginning of the curve and press the left button of the mouse to close the current curve automatically.

When command “Curve” selected, users can move the mouse to the node on the end of the curve and press the left button of the mouse to change the node of the current object into “sharp”.

When command “Curve” selected, users can move the mouse to the points which are not nodes and press the left button of the mouse to add a node to the current position of the curve.

4.3 Rectangle

To draw a rectangle, users can select command “Rectangle” in Draw Menu or click the icon .

Under the command “Rectangle”, users can press the left button of the mouse and drag it to draw a rectangle.

Under the command “Rectangle”, users can draw a square by pressing the left button of the mouse and drawing it when press “Ctrl” key synchronously.

After drawing and selecting, the Properties Toolbar will display a feature like Figure 4-3 shows.

Arc radius: This refers to the smooth degree of the rectangle’s four corners, and when the degrees are 100%, then the rectangle changes into a circle.

All corner Round: When selected, users can change the angles of the four corners at the same time just by changing one of them.

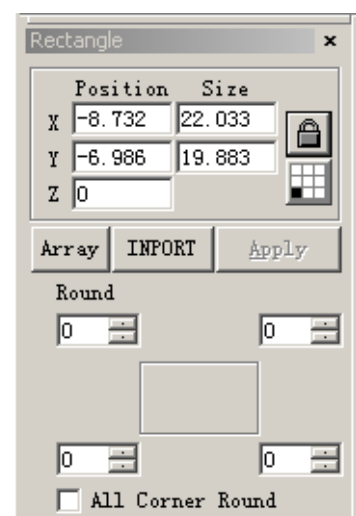


Figure 4-3 Rectangle properties

NOTE: After changing the parameters in the Properties Toolbar each time, we must click “Apply” button to update the object with new parameters.

4.4 Circle

To draw a circle, users can select command “Circle” in the Draw Menu or click the icon . Under the command “Circle”, users can press the left button and drag it to draw a circle. After drawing and selecting, the Properties Toolbar will display a feature like Figure 4-4 shows.

Diameter: the diameter of the circle

Starting Angle: the angle between the starting point and the centre of a circle

: This figure refers to the drawing direction of the circle is clockwise.

: This figure refers to the drawing direction of the circle is anticlockwise.

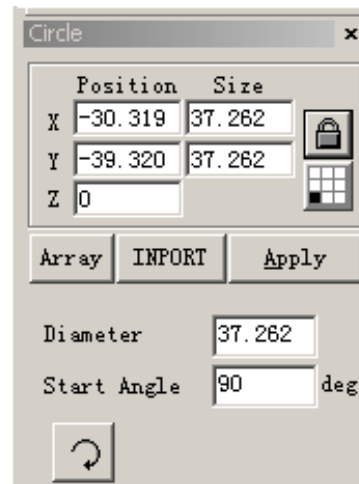


Figure 4-4 Circle Properties

4.5 Ellipse

To draw an ellipse, users can select command “Ellipse” in Draw Menu or click the icon . Under the command “Ellipse”, users can press the left button of the mouse and drag it to draw an ellipse.

Under the command “Ellipse”, users can draw a circle by pressing the left button of the mouse and drawing it when press “Ctrl” key synchronously.

After drawing and selecting, the Properties Toolbar will display a feature like Figure 4-5 shows.

Start Angle: the angle between the starting point and the centre of an ellipse

End Angle: the angle between the ending point and the centre of an ellipse

: This figure refers to the drawing direction of the ellipse is clockwise.

: This figure refers to the drawing direction of the ellipse is anticlockwise.

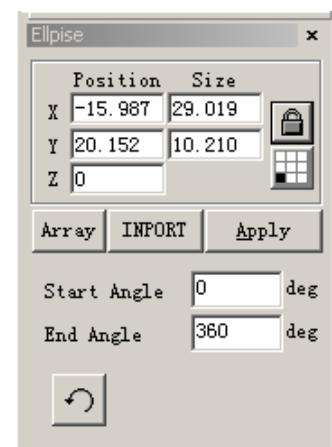


Figure 4-5 Ellipse Properties

4.6 Polygon

To draw a polygon, users can select command “Polygon” in Draw Menu or click icon .

Under the command “Polygon”, users can press the left button of the mouse and drag it to draw a polygon.

After drawing and selecting, the Properties Toolbar will display a feature like Figure 4-6 shows.

Edge Num: This item indicates the number of the polygon’s borders, and that is at least three. Normally the border number is less than ten, and with borders more than ten the polygon will look like a circle.



: When selected, the current polygon to be drawn will be a convex polygon.



: When selected, the current polygon to be drawn will be a star.

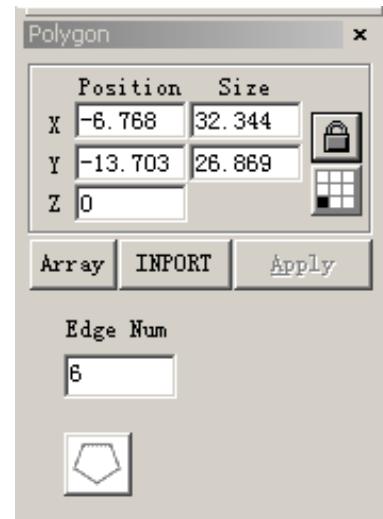


Figure 4-6 Polygon Properties

4.7 Text

Typing text directly in the workspace is supported in SIC- LASER PC, and many types of fonts are supported. To type text, users can select command “Text” in the

Draw Menu or click icon .

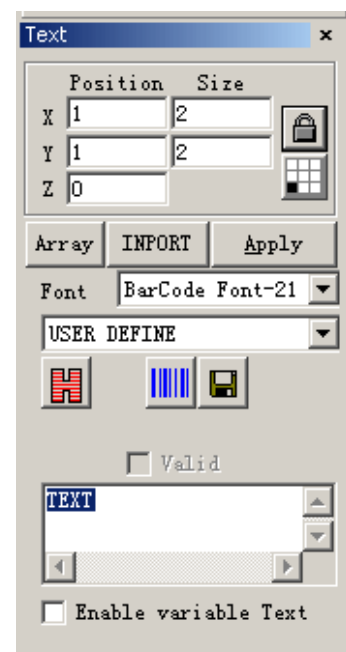
Under the command “Text”, users can set up a starting point at any position wanted in the workspace to type characters by left click mouse.

4.7.1 Character Properties

When selected, the Properties Toolbar will display a feature like Figure 4-7 shows. Users may change the characters by typing in the text box.

SIC- LASER PC supports five types of text. (Figure 4-8)

When users select a type, a font list under that type will appear to show all the available fonts. Figure 4-9 is the list of TrueType.



4-7 Character Properties

Figure 4-10 is the list of Barcode Type.

Height: the average height of characters



: Figure 4-11 shows the dialog box after clicking this icon.



: When selected, the current text aligns left.



: When selected, the current text aligns center.



: When selected, the current text aligns right.

Enable the same width character: make the width of all characters the same

Char Width: the average width of characters

Char Angle: the degrees the characters incline

Char space: the distance between characters

Lines space: the distance between rows

Empty char width: the width of empty char

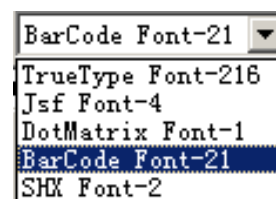


Figure 4-8 Types of Text

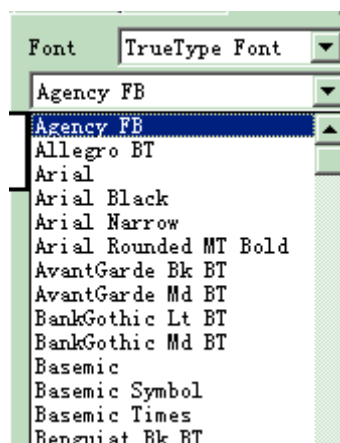


Figure 4-9 TrueType List

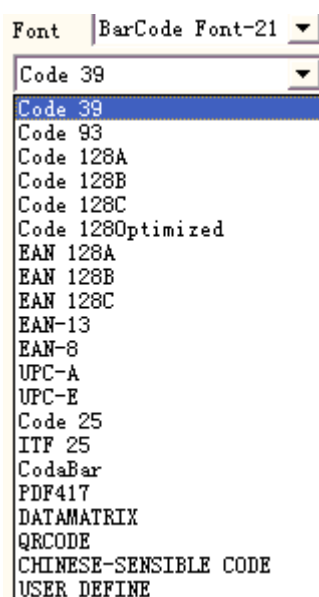


Figure 4-10 List of Barcode Type

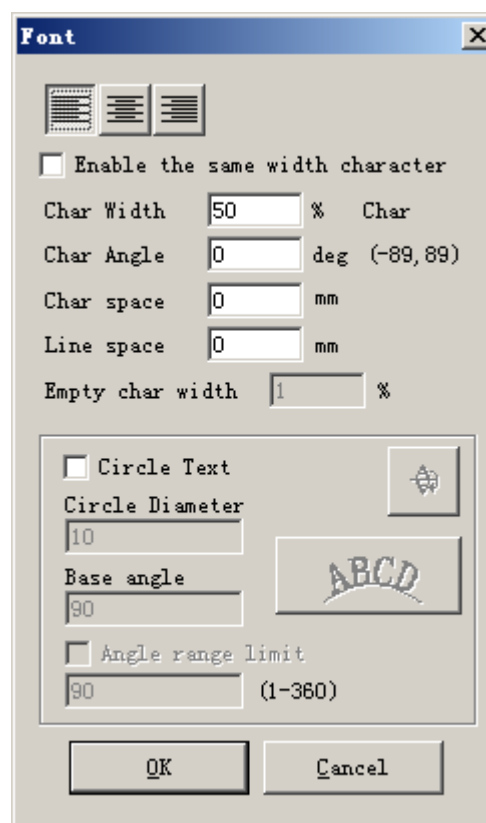
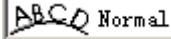


Figure 4-11 Character Options

4.7.2 Curve text function

SIC- LASER PC support curve text function, if the user draw text close enough from a curve, the

text will follow it. When current text is curve text, click , figure 4-12 will pop-up:

 means text will be parallel with the curve, as figure 4-13 shows.

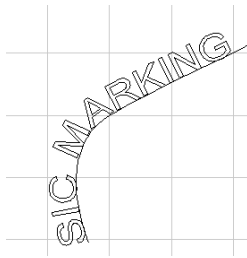
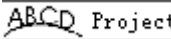


Figure 4-13 normal arrange

 means text will be vertical with the curve, as figure 4-14 shows.

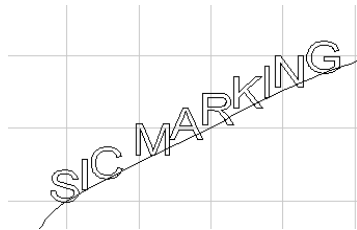


Figure 4-14 vertical arrange

 means the base line of the text is superposition with the curve, as figure 4-14 shows.

 means the top of the text is superposition with the curve, as figure 4-15 shows.



Figure 4-15 top arrange

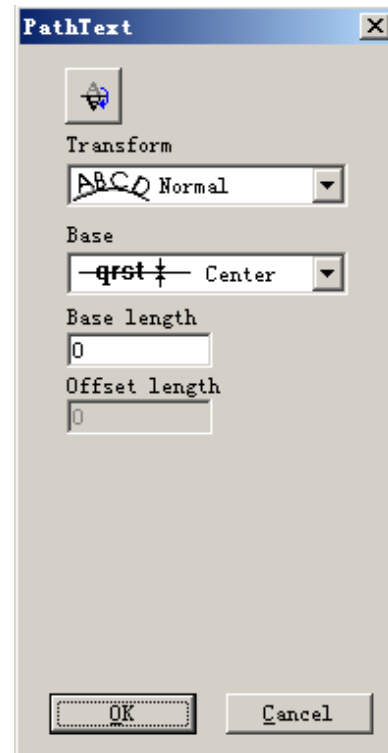


Figure 4-12 curve text



means bottom of the text is superposition with curve, as figure 4-16 shows.



Figure 4-16 bottom arrange



means middle of the text is superposition with curve, as figure 4-17 shows.



Figure 4-17 middle arrange



means text stay on the curve freely along with the curve, the position of

Base length
0
Offset length
0

the text is up to (Figure 4-18).



Figure 4-18 freely arrange (1 base Length, 2 Offset°



puts the text on the other side of the curve, after this function (Figure 4-19).

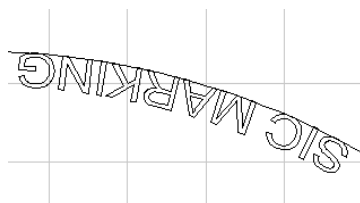


Figure 4-19 put text on the other side of the curve

Circle Diameter
10

Base angle
90

☐ Angle range limit
90 (1-360)

When put text on circle, we use this function.

Base angle: means the angle of the base line of the text.

Angle range limit: when we click it, no matter how many characters we input, system will compress all the characters in the limit angle, as figure 4-20 shows.

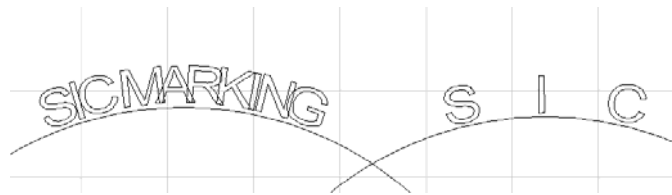


Figure 4-20 limits the angle as 45

4.7.3 Circle Text

On the Font option (see Figure 4-11). When selected circleText, the text will align according to the user circle Diameter definition (see Figure 4-21)

Base angle: The benchmark of the text aligning the circle.

Angle range limit: When checked, no matter how much chars that users type in, the text will be limited in the angle range. (Figure 4-20)

☒ CircleText

Circle Diameter
10

Base angle
210.000

☐ Angle range limit
90.000 (1-360)

ABCD

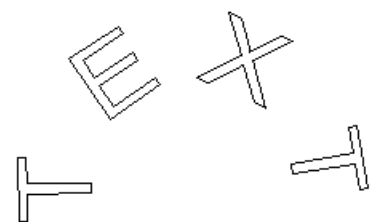


Figure 4-21 CircleText

4.7.4 Barcode Text



When users click the icon , a dialog box will be displayed as Figure 4-22 shows.

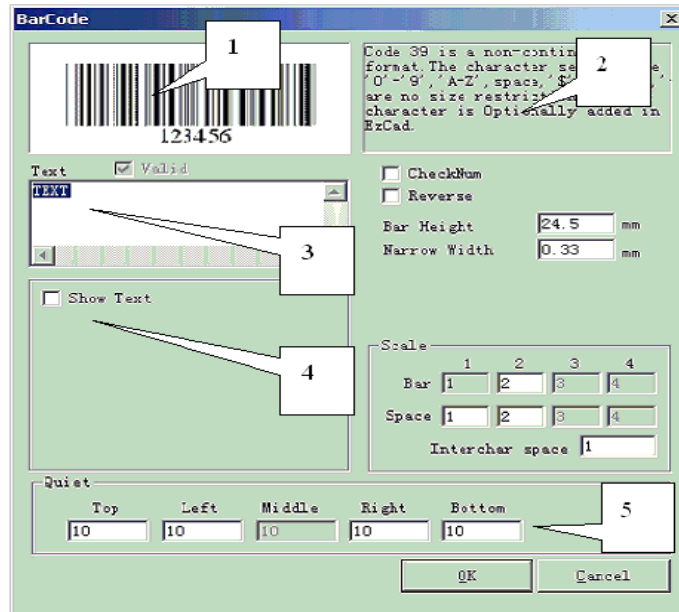


Figure 4-22 Barcode Text

1. **Sketch Map**
Preview of the Barcode's format
2. **Barcode Information**
Information about the barcode's format:
type of characters valid, size restriction,
etc
3. **Text**
Datan encoded. If the characters are
valid, there is a cross selected in

4. **Show Text**
If selected, show the corresponded text under the barcode (Figure 4-23)

Font: The font of the characters to be displayed

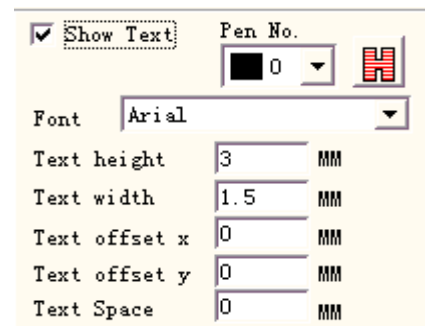
Width: the width of the characters

Height: the height of the characters

Text Offset X: When selected and set up, the text displayed under the barcode will be moved towards either the positive or the negative directions of X axis.

Text Offset Y: When selected and set up, the text displayed under the barcode will be moved towards either the positive or the negative directions of Y axis.

Text Space: the space between characters



5. **Quiet:** Refer to the size of the barcode's blank area, when let the barcode "Reverse" valid.

- One-Dimensional Barcode

This kind of barcode consists of **bar** and **space** one by one. The barcode information is carried by different width and position of the **bars** and the **space**. The volume of information carried depends of the width and the precision. Wider the barcode is, more there are **bars** and **space**, and more information are encoded. Figure 4-23 shows a feature of parameter setting when a one-dimensional barcode is chosen.

CheckNum: This refers if the current barcode needs a verify code. User can choose which barcode needs a verify code.

Reverse: Exchange the part of the Barcode to mark. For example, this is useful with some material were appeared light colors after marking.

Bar Height: the height of the barcode

Narrow Width: The width of the narrowest single module.



The dialog box has a light green background. At the top, there are two checkboxes: 'CheckNum' and 'Reverse', both of which are currently unchecked. Below these are two input fields: 'Bar Height' with the value '24.5' and 'mm' to its right, and 'Narrow Width' with the value '0.33' and 'mm' to its right. At the bottom, there is a section titled 'Scale' which contains a grid of input fields for 'Bar' and 'Space' (values 1, 2, 3, 4) and a single input field for 'Interchar space' with the value '1'.

Figure 4-23 One-Dimensional Barcode Parameter Setting

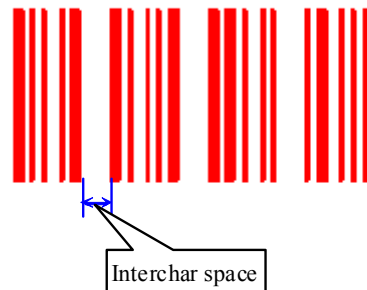


Figure 4-24 Characters' Distance

Interchar space: The interchar-gap-width

Scale:

Bar: the width of one module

Space: the width of the space

Quiet:

The size of the barcode's blank area, when let the barcode "Reverse" valid. The actual size of the blank area is the multiple of the unit bar.

- Two-Dimensional Barcode

1. PDF417 Barcode



Figure 4-25 PDF417 Barcode



Figure 4-26 Compress PDF417 Barcode

PDF is the abbreviation of the Portable Data File. Figure 4-18 is the demonstration of PDF417 Barcode and Figure 4-25 of the Compress PDF417 Barcode. Figure 4-27 is the parameter setting of the PDF417 Barcode.

Bar Height: the height of the barcode

Narrow Width: The width of a single module.

Level: the Error-Checking Level of PDF417 barcode, from 0 to 8

Lines and Columns: the lines and Columns of PDF417 barcode

Figure 4-27 PDF417 parameter

2. Data Matrix Barcode:

Data Matrix is a two-dimensional barcode based on Matrix. Currently, SIC- LASER PC supports Ecc200.

Figure 4-29 shows the parameter setting of Data Matrix Barcode.

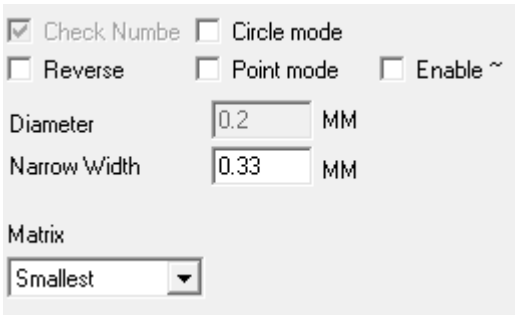


Figure 4-28 Data Matrix Barcode Parameter Setting

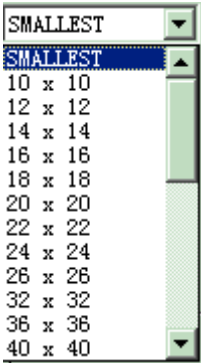


Figure 4-29 Data Matrix Barcode Size

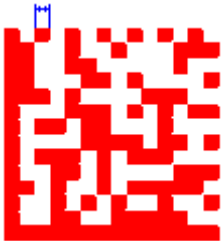


Figure 4-30 Data Matrix Barcode Width

Data Matrix has various fixed size, and users can choose what they want. If the smallest size is chosen, the system will automatically select the smallest frame to fit the all text.

Narrow Width: the width of the unit cell (Figure 4-28)

3. QR Barcode:

QR CODE Barcode is a two dimensional (2D) code format.

The figures 4-31 , 4-32 and 4-33 are the parameter of QR CODE Barcode.



Figure 4-31 QR CODE Barcode

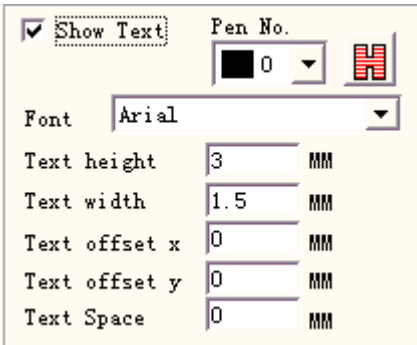


Figure 4-32 QR CODE Barcode text setting

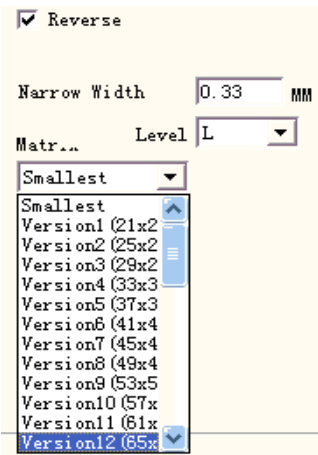


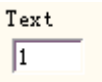
Figure 4-33 QR CODE Barcode Parameter Setting

4.7.4 Variable Text

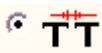
The function of variable text is available after ☒ Enable variable Text is selected. Variable Text is a disciplinary and dynamic text which can be customized during the operation.



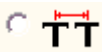
4-34 Variable text attributes



The adjacent character distance in current text character arrangement situation



Space between the end of a character and the beginning of the following



The space between the middle of two characters



Add a variable text. The dialogue box in Figure 4-35 will appear

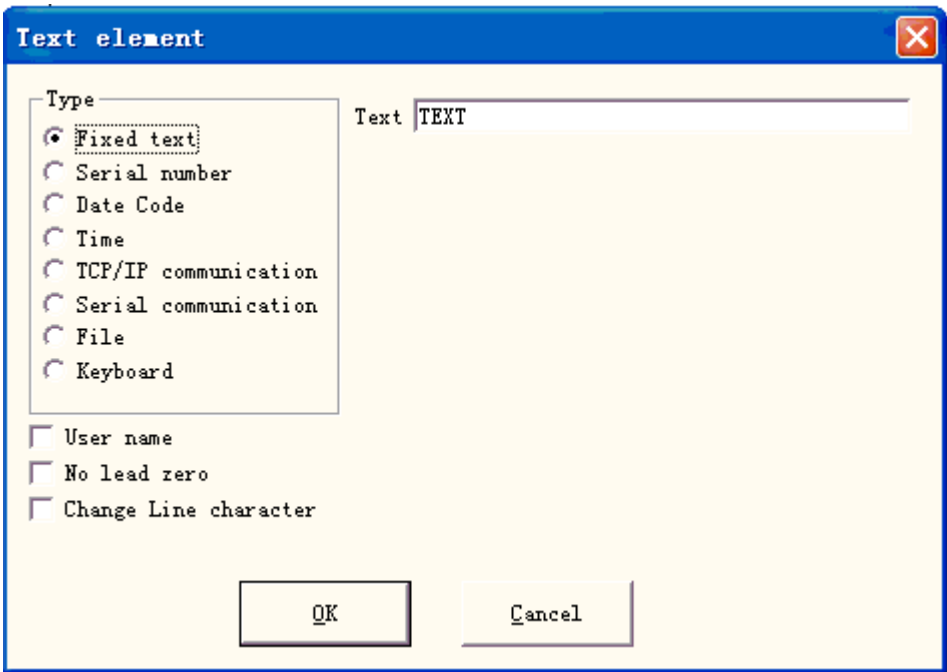


Figure 4-35 Text element dialog box

Currently SIC- LASER PC supports 8 types of variable text:

- **Fixed text:** Invariable element in the operating process.
- **Serial number:** The system will change the text according to the fixed increment in the operating process.
- **Date Code:** The system will automatically pick up date information from the computer as a new formed text.
- **Time:** The system will automatically pick up time information from the computer as a new formed text.
- **File:** The system will successively read what to be marked in a customized text or excel file.
- **Keyboard:** Users can type text to be marked through keyboard when the marking is in process.

Fixed text

The fixed text is refers to the fixed invariable element in the operation process.

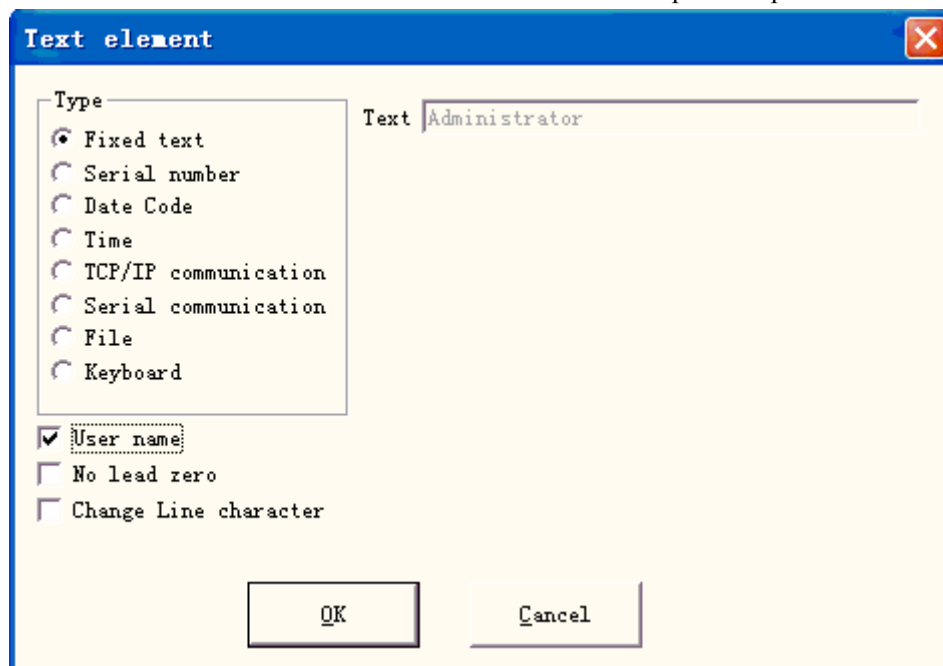


Figure 4-36 Fixed text

User Name: mark the user name currently connected to the software. The administrator must enable “You must enter and password before using” (see Chapter 2.6.7), then sets a user name and the password for each operator.

Serial number

Serial number text is a text which is changed according to the fixed increment when in the operating process. When selected, a serial number parameter setting will automatically appear in the variable text dialog box. (Figure 4-37)

Figure 4-37 Serial number parameter definition

Start SN: The First serial number to be marked at the beginning

Current SN: The serial number to be marked currently

Limit: when mark the limit serial number, it will return to start serial number automatically

Increment: the increment of the current serial number. The value may be plus or minus

When the increment is “1”, and if the starting serial number is 0000, there will be an increment “1” added on the previous serial number. For example, 0000, 0001, 0002, 0003 ... 9997, 9998, 9999, and when it comes to 9999, the system will be back to 0000 automatically.

When the increment is “5”, and if the starting serial number is 0000, the serial number is: 0000, 0005, 0010, 0015, 0020, 0025 ...

Others can be analogized by this.

Marker: This item indicates how many times every serial number is marked before increment.

Current num: the marking time of current serial number, when marking number equals to marker, it will turn to 0 automatically

☐ **Filter belows:** if click it, software won't mark special number in special digit.

won't mark numbers ending with 4, * means any digit.

Figure 4-38 Serial number modes

Mode: The mode current series number used, see the figure 4-38.

- **Dec:** Series number carry according to decimal system, the effective characters are from 0 to 9.
- **HEX:** Series number carry according to hexadecimal system in capital letter, the effective characters are 0 to 9 then, A to F.

Figure 4-39 User define dialog box

- **hex:** Series number carry according to hexadecimal system in small letter, the effective characters are from 0 to 9 then, a to f.
- **User define:** The series number carry according to user defines system, after selecting, the system will display a dialog box like Figure 4-39 shows.

Date Code

When the laser is marking, the system will automatically pick up date information from the computer as a new formed text. When selected, a date parameter definition will appear in the dialog box. (Figure 4-40)

NB: SIC LASER PC will always use currents computer's clock dates and hours.

Year—2010: Computer's current year in 4 characters. Example: 2010

Year—10: Computer's current year in 2 characters, the last digits. Example: 10

Month—09: Computer's current month in 2 characters. Example: 09 is for September

Day—13: Computer's current day of the month in 2 characters. Example: 13 is for the thirteen day of the month

Day—256: Julian day. Computer's current day number of the year in 3 characters.

Example: 001 represent January 1st, 002 represent is on January 2nd, 256 represents September 13th, etc

Day of week—5: Computer's current day number of the week in 1 character.

Example: 1 is for Monday

Week of year—38: Computer's current week number in 2 characters.

Example: 01 is for the week from January 1 to January 7, 02 is for the week of January 8 to January 14, etc

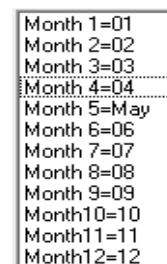
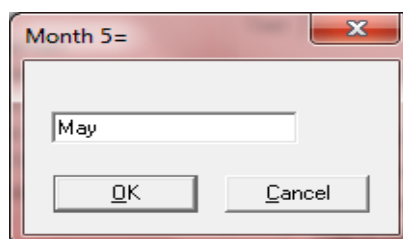
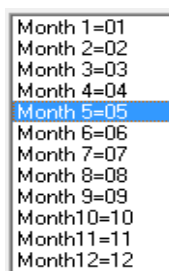
Date: Antedate the computer's current date by date, month or year.

Example: If the computer's current date is 13th of September 2010 and Date by day is 10, laser will mark 23.

User defined: User can modify default characters applied for a year, month, week or day with a double click on the selected characters.



Figure 4-40 Date dialog box



Double click on a character and this dialog box will appear

Figure 4-41 User define parameter

Time

When the laser is marking, the system will automatically pick up time information from the computer as a new formed text. When selected, a time parameter definition will appear in the dialog box. (Figure 4-42)

Hour—24: Use current computer clock's hour for the corresponding text, the time format is 24-hour-setting

Hour—12: Use current computer clock's hour for the corresponding text, the time format is 12-hour-setting

Minute: Use current computer clock's minute for the corresponding text.

Second: Use current computer clock's second for the corresponding text.

Time Section: Divides into 24 time sections one day of 24 hours, the user may define each time section as a text.

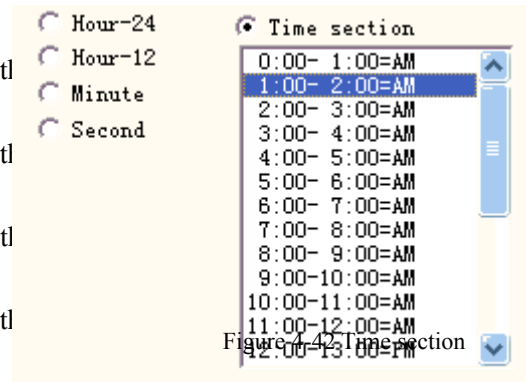


Figure 4-42 Time section

File

1. Txt files

When select a TXT file, a dialog box (Figure 4-43) will appear to ask for the file's name and the current text's line number and the increment.

Auto reset: If checked, the line number will automatically change to 0 when reach the last line. The next mark will restart from the first line.

Read all lines: The entire text will be marked.

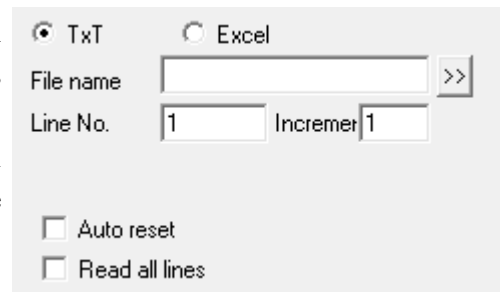


Figure 4-43 Txt document parameters

2. Excel files

When select an Excel file, a dialog box (Figure 4-44) will appear to ask for the file's name and the current excel's line number and the increment. Reference column is A.

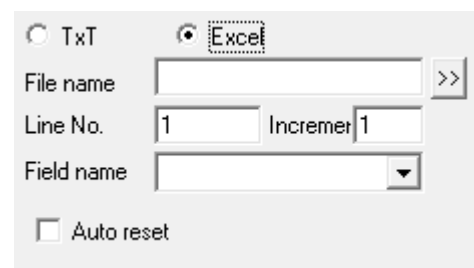


Figure 4-44 Excel document parameters

Keyboard

With the keyboard function, SIC LASER PC will ask the operator to enter the text to mark with the keyboard before each marking. When select the keyboard element, a dialog box (Figure 4-45) will appear to ask for the keyboard element parameters.

Fixed char count: user must input text with a fixed

Prompt: In the processing, the system will display input dialog box which asks the user to input the text (Figure 4-46)

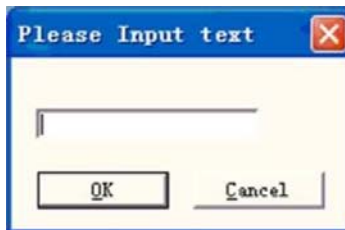


Figure 4-46 Keyboard dialog box

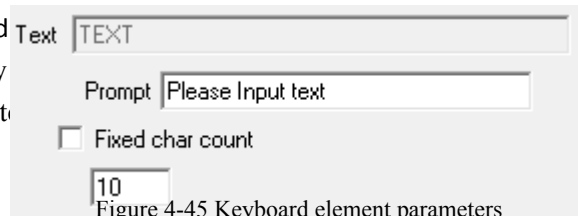


Figure 4-45 Keyboard element parameters

4.8 Bitmap

To add a photo, users may select command “Bitmap” in the Draw Menu or click icon  in the Toolbar, a dialog box (Figure 4.47) will appear.

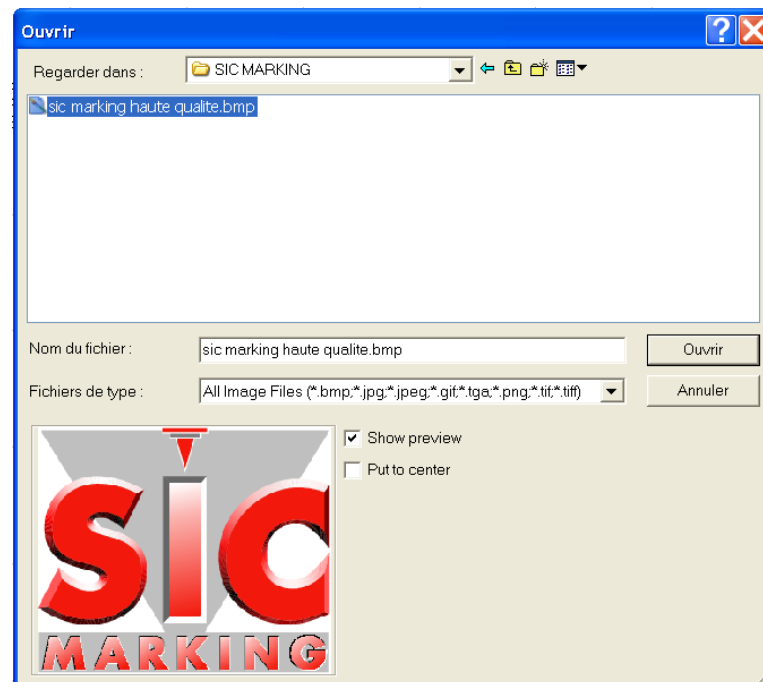


Figure 4-47 Add a photo

The current supported graphic file formats are: Bmp; Jpeg, Jpg; Gif; Tga; Png; Tiff, Tif;

Show Preview: When users select a graphic file, there will be a preview displayed in the dialog box.

Put to center: put the photo's center in the origin.

A "Bitmap" parameter setting will appear in the Property Toolbar as Figure 4-48 shows

Dynamic file: Allow to reread files when in process.

Fixed DPI: When selected, the system will fix the unfixed DPI of the dynamic file (DPI: Dot per Inch. 1 inch is about 25.4 millimeters). The higher the DPI's level is, the closer the dots are, the better the quality is but the longer the marking time is.

Fixed Size X: When checked, the width of the dynamic file will be preserved in an appointed size, and if unchecked, the photo's width will be the original size of the photo.

Fixed Size Y: When checked, the height of the dynamic file will be preserved in an appointed size, and if unchecked, the photo's height will be the original size of the photo.

Fixed position: the reference of the dynamic file while the size change

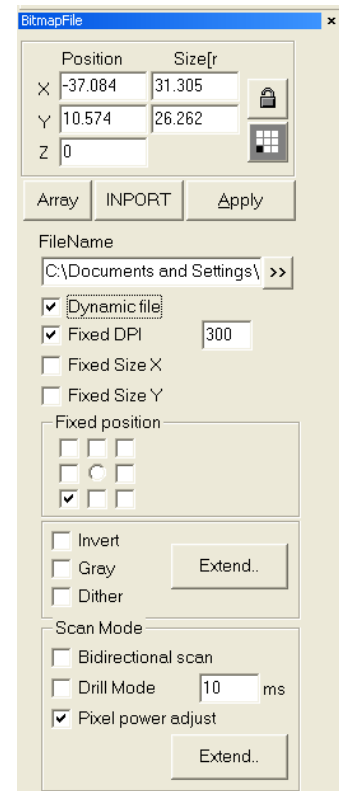


Figure 4-48 Bitmap Parameter

Image Manipulation:

Invert: run negative effect on photos (Figure 4-49)



Figure 4-49 Invert Effect (Left is original.)

Gray: change file's colors into a level of grey (Figure 4-50)



Figure 4-50 Color and Grey (Left is original.)

Dither: This effect is similar with the function “Grey Adjust” in Adobe PhotoShop. It uses color black and white to simulate grey image, so as to achieve a grey effect with dots arranged in different densities, as Figure 4-51 shows.



Figure 4-51 Dither

Click the “Expand” button to run the “Bitmap” dialog box. (Figure 4-52)

Lighten: adjust the current image's brightness and contrast values.

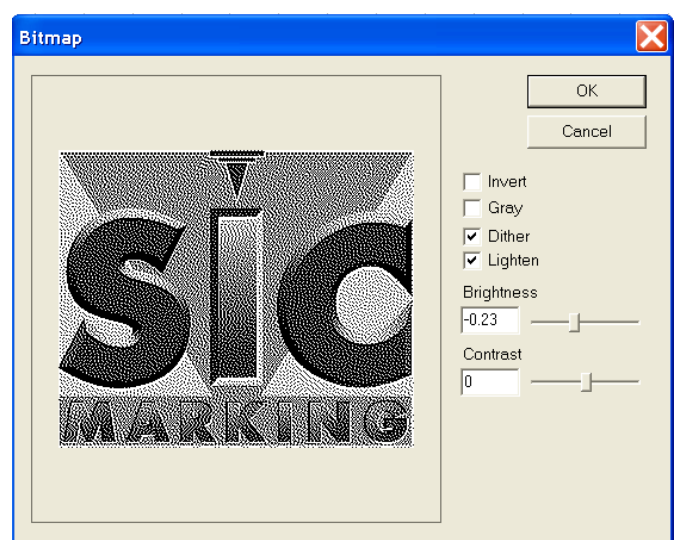


Figure 4-52 Bitmap Dialog Box

Scan Mode:

Bidirectional Scan: the scan mode is bidirectional when in marking process (Figure 4-53)



Figure 4-53 Left is unilateral scan; right is bidirectional.

Drill mode: Fix marking time for each dot.

Adjust Power: Adjust laser's power according to each dot's grey level.

Extend Parameter: Figure 4-54

Y Scan: The scan will run along Y axis line by line.

Scan line Increment: This item indicates if scan line by line or skip some lines. This function may quicken the marking speed when low precision marking is required.

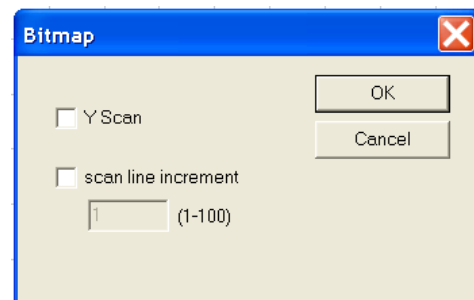


Figure 4-54 Scan extended parameters

4.9 Vector File

To input a vector file, users can select command “Vector File” in Draw Menu or click icon  in the Toolbar.

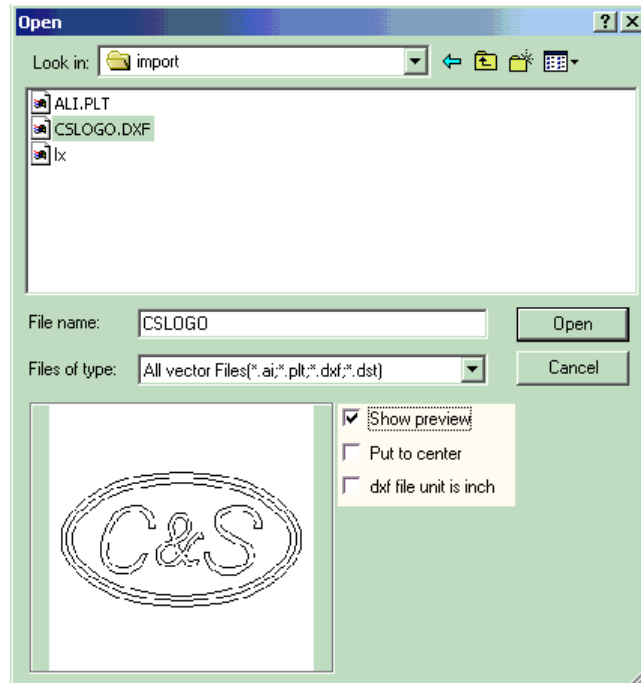


Figure 4-55 Input a Vector File

The current supported vector file formats are: PLT, DXF, AI and DST

NOTE: If the vector files includes color information (when draw it by image software like CorelDraw, AutoCAD, Photoshop and so on), LASER PC can distinguish the color automatically. Then user can pick the object according to the color or pen (see Chapter 4.12) and set marking parameters

When users have opened a vector file, a vector file parameter setting as Figure 4-56 shows will appear.

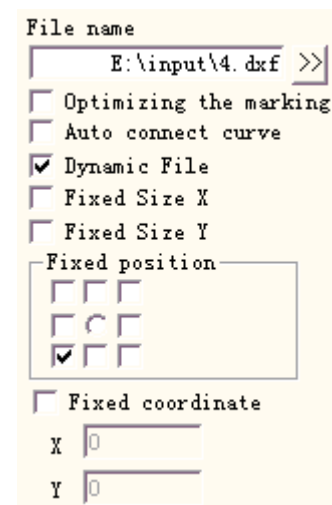


Figure 4-57 Vector File Parameter Setting

4.10 Time-lapser

The time lapser icon in the Toolbar is .

Waiting time: The marking will pause until the specific time has passed.



Figure 4-58 Waiting Time

4.13 Select

Icon  on the top of the Draw Toolbar is used to select object. The pressed-down state of this icon indicates that the current command is “select”. Now, you can use mouse to click object in the workspace to select it. SIC- LASER PC software has “auto-snap” function. When you move the mouse in the workspace and approach to a curve, the mouse pointer will automatically be changed into , and now you can press the left button of the mouse to select the object.

You can also select an object by moving the mouse while pressing the left button of the mouse, and there will be a dashed frame appearing in the area as the mouse move. This selection method is called “Frame Select”. If the moving direction of the mouse is from left to right, then only the objects completely involved in the dashed frame will be selected; and if the moving direction of the mouse is from right to left, then all the objects touched by the dashed frame will be selected.

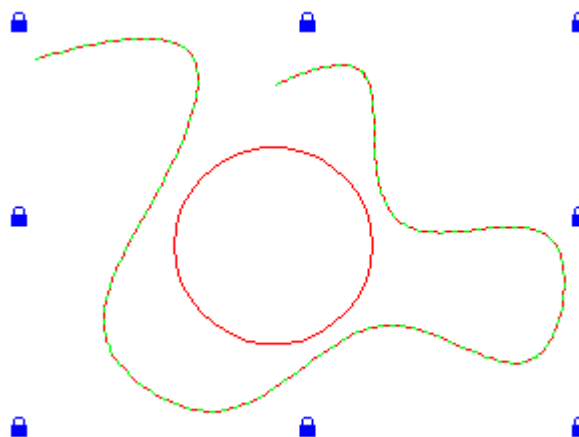


Figure 4-65 Lock an Object

When command “Select” is chosen, a Select Toolbar will appear, and you can achieve some specific operations. (Figure 4-59)



Figure 4-59 Select Toolbar



: Select all the objects in the current workspace.



: Invert Selection



: Delete the current object selected.



: Lock the current object. Users can not take any operation on the locked object.



: Unlock the object locked



: Unlock all the objects locked.



: Put object selected on the origin



: Select objects by pen. When clicked, a dialog box (Figure 4-60) will appear.

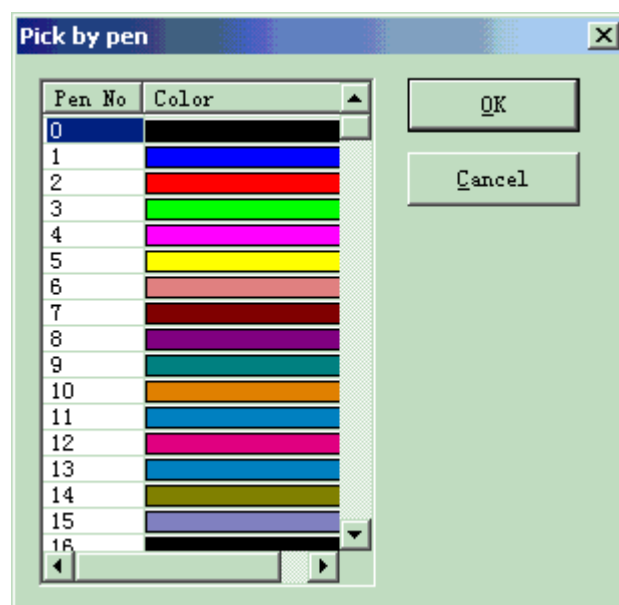


Figure 4-60 Select object by Pen

4.14 Node Editing

All the objects drawn in SIC- LASER PC are vector graphs. Users can modify an object's shape by editing the nodes.

To edit nodes, you may press icon  in the Draw Toolbar. When clicking an object in the workspace, there will be a node appearing around the object. Nodes are denoted as hollow squares, the bigger one is the starting point of the curve. When selected, a Node Editing Toolbar will appear as Figure 4-61 shows.

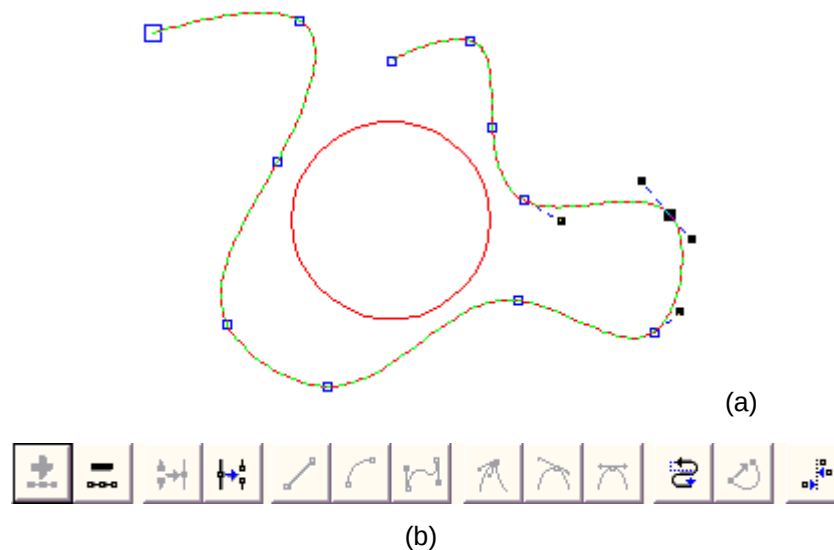


Figure 4-61 Node Editing

(a) Nodes (b) Node Editing Toolbar

- : Add a node. When click any point on the curve where has no node, there will be a black solid circle appearing, users may add a node by click this icon.
- : Delete a node. When clicking any node on the curve, the node will be blacked, users may delete the node by click this icon.
- : Combine two nodes. If two nodes are close enough, users may “frame select” the two nodes and click this icon to combine them into one node.
- : Separate a node. When users click a node on the curve, the node will be blacked, and then we may click this icon to separate this node into two separated nodes.
- : Turn curves into lines. : Turn curves into arcs. : Turn curves into curves
Users may click any position between two neighbored nodes and select the command (Line/Arc/Curve) to make the curve between the two nodes into a (line/arc/curve).

- : Sharp a node. When selected, a sharp will take the place of the node, and the curve is sharp.
- : Smooth a node. When selected, the node will be changed into a smooth curve.
- : Symmetry a curve. If you click a node and select command “Symmetry”, the curves on both sides of the node will be symmetrical.
- : Invert the direction of a curve by exchanging the starting and ending points.
- : Close a curve.
- : Align objects. When users “frame select” more than two nodes and click this icon, a dialog box of Aligning Nodes will appears, and you can choose the ways of aligning, top, bottom, left or right for example.

NOTE: Node edition is unavailable on text objects and hatch objects; you can edit the path’s nodes of curved texts.

Chapter 5 Modify Menu

Commands in Modify Menu allow operations on selected objects, such as Transformation, Plastic, Curve Editing, Aligning, etc. (Figure 5-1)

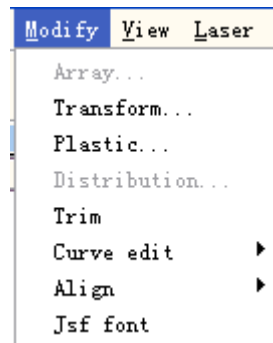


Figure 5-1 Modify Menu

5.1 Array

When selected, a dialog box will appear. If the array type selected is “Rectangle”, the dialog box will be Figure 5-2a. If the array type selected is “Circle”, the dialog box will be Figure 5-2b

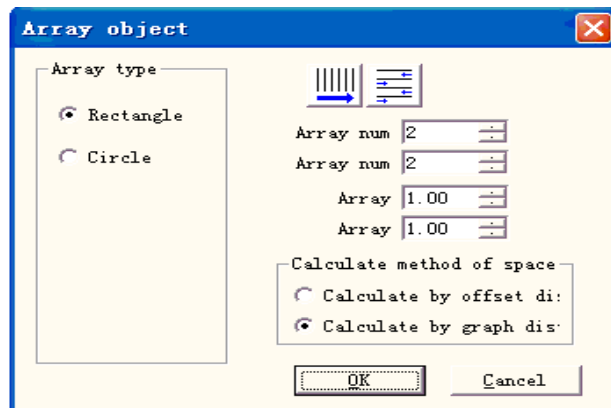


Figure 5-2-a Array dialog box (Rectangle)

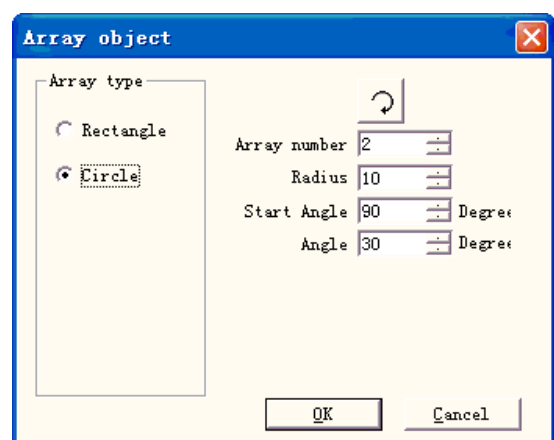


Figure 5-2-b Array dialog box(Circle)

5.2 Transform

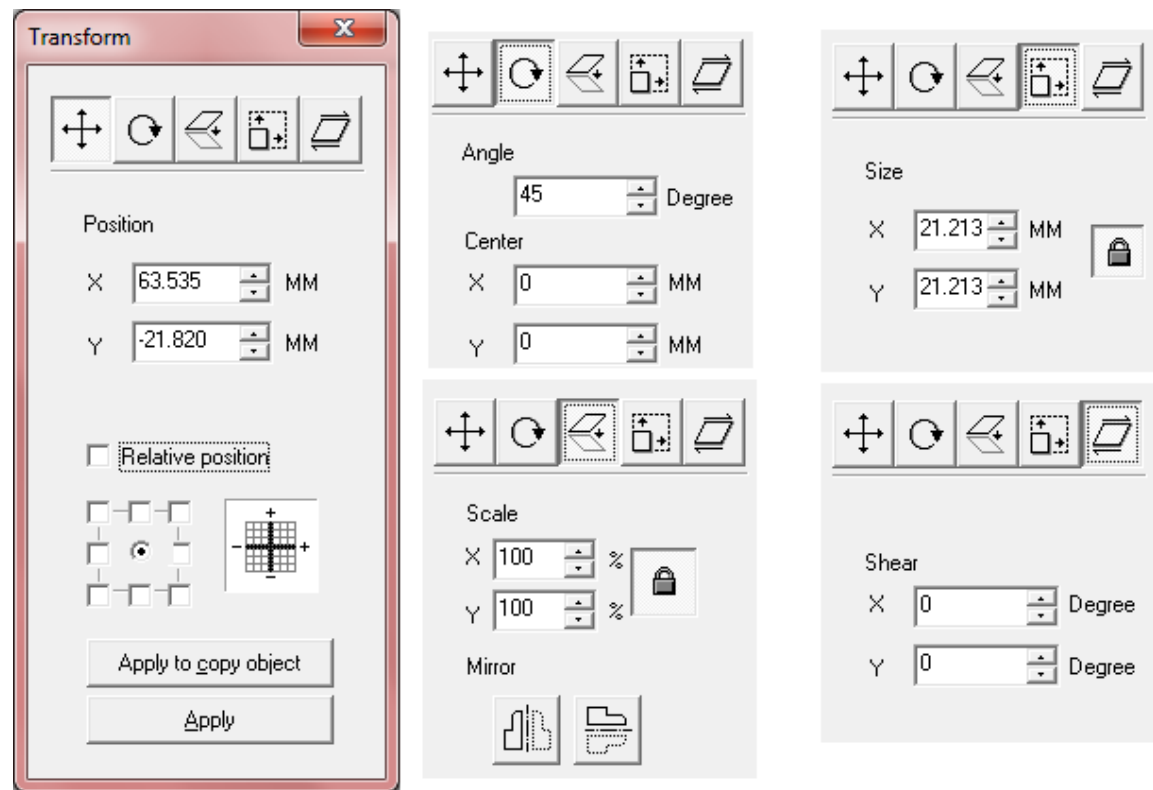


Figure 5-3 Transform

5.2.1 Move



: stroll Tool for moving objects

5.2.2 Rotate



: rotate your object

5.2.3 Mirror



: mirror the current selected object

Scale: the ratio of X/Y size after mirror



: Vertical mirror



: horizontal mirror

5.2.4 Zoom



: zoom your objects

5.2.5 Lean



: lean the object

5.3 Plastic

When selected, a parameter setting box will appear as Figure 5-4 shows. Figure 5-5 shows examples of the following three items.

-  : Joint two close intersect areas into one
-  : Shear a close intersect area contained in another
-  : pick up the intersect part of two close intersect areas



Figure 5-4 Plastic

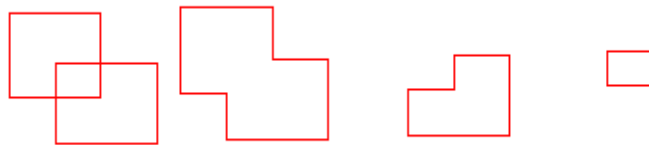


Figure 5-5 Plastic 1. Original 2. Joint 3. Shear 4. Intersect

5.4 Curve Editing

1. Auto- Connect:

When selected, a dialog box will appear as Figure 5-6 shows.

If the distance between two curves' starting and ending points is less than the parameter set, the two curves will be jointed into one.

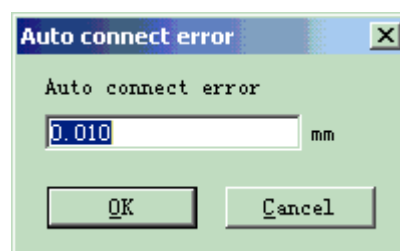


Figure 5-6 Auto-Connect

2. Remove cross point:

When user click curve editing->remove cross point, follow dialog window will pop-up as fig 5-7 shows.

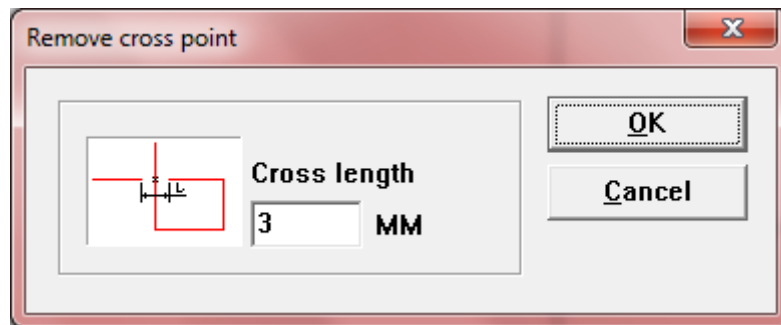
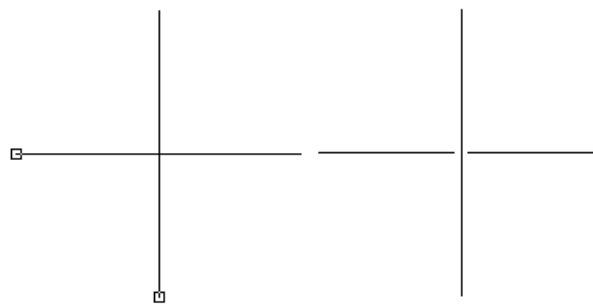


fig 5-7 break cross point



(a) before remove cross point

(b) after remove cross point

Fig 5-8 results of remove cross point

5.5 Align

Command “Align” is available only when more than one object is selected in the workspace. It is used to align the selected objects on the two-dimensional plane. There are several ways to align:

- **Left:** All objects align left.
- **Right:** All objects align right.
- **Vertical:** All objects align vertical.
- **Top:** All objects align top.
- **Bottom:** All objects align bottom.
- **Horizontal:** All objects align horizontal.
- **Center:** All objects align center. This way may cause moves on both horizontal and vertical directions.

Note: The benchmark to align is according to the last object users select, and other objects align behind it.

5.6 JSF font

5.6.1 The definition for the function of JSF font library.

JSF font is the dedicated font of LASER PC software; users can build up their own JSF fonts. The file with “JSF” postfix is the proprietary font file of LASER PC, every JSF font file has one kind of font.

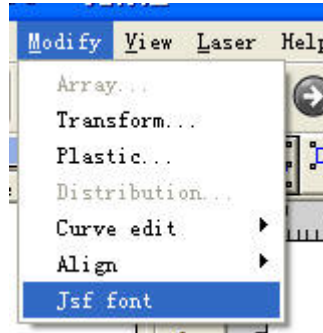


Figure 5-9

When the user click JSF font, system will show a dialogue as figure 5-10.

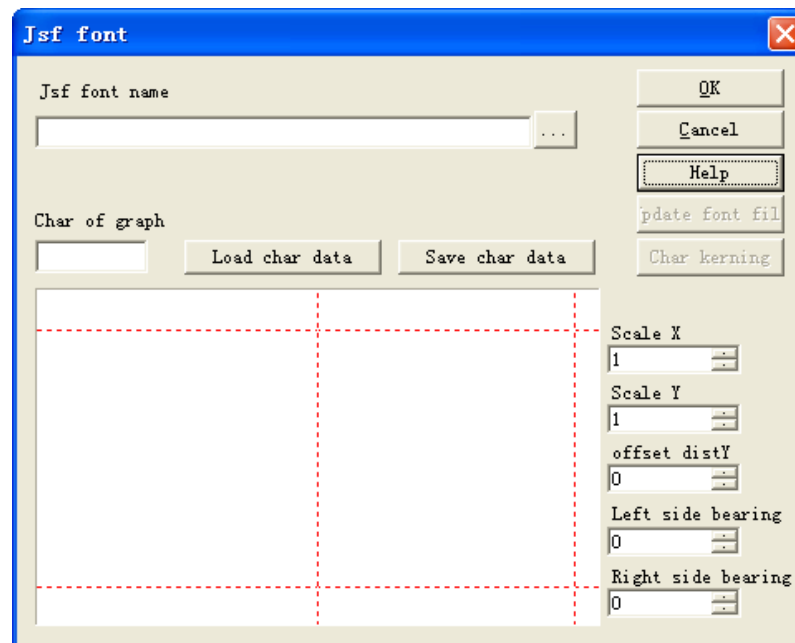


Fig 5-10 JSF font

When "Help" button selected, a dialog box will appear (Figure 5-11).

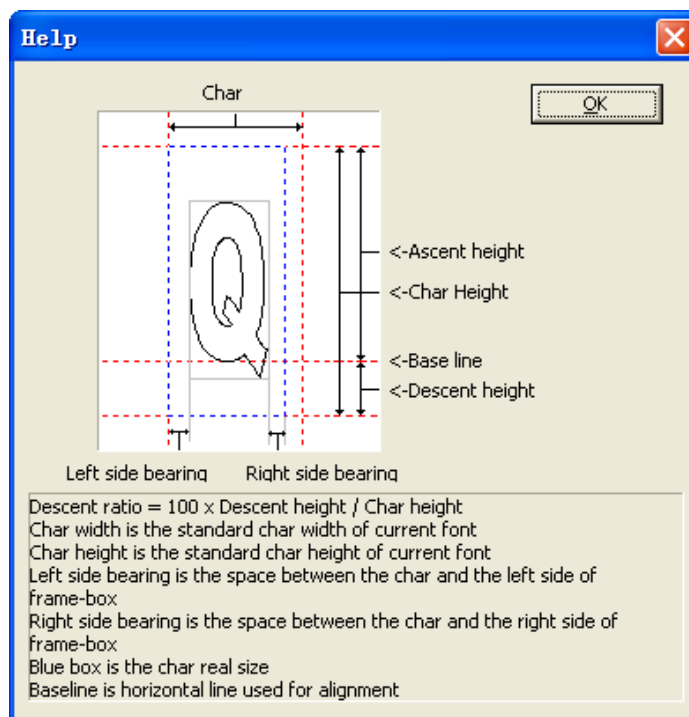


Figure 5-11 Help

In addition to the width and height which stand for the graphic characters, the software also identifies the font size on 'Ascent height', 'Descent height', 'Left-side bearing', 'Right-side bearing' etc.

If the figure designed is in the grey scope as graphics 5-18 define, LASER PC identified area is the blue dotted line.

All of the graphic's width, height, 'Ascent height', 'Descent height', 'Left side bearing', 'Right side bearing' designed can be modified with the software.

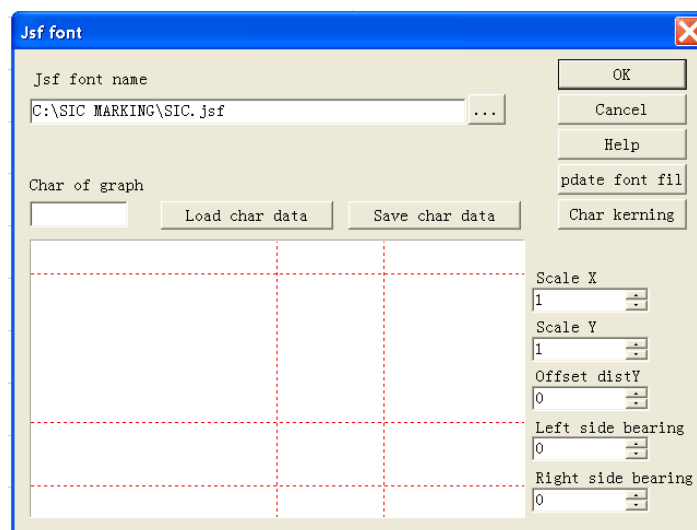


Figure 5-12 select a font file

Jsf font name: The name of font needed to be established or modified.

Char of graph: The character that corresponds with graphics in “Preview”.

Load char data: Load the data of the character from the font library.

Save char data: Replace the corresponding characters with the current Preview. If it's the renewed characters, you should save the graph in “Preview” in the corresponding data.

Scale X: The X-direction scale of the graph in “Preview”. Changing this parameter adjusts the width of the graph designed which can stands for the characters. The default value is 1. Increase it, graphics turns broad; reduce it, graphics gets narrowed.

Scale Y: The Y-direction scale of the graph in “Preview”. Changing this parameter adjusts the width of the graph designed which can stands for the characters. The default value is 1. Increase it, graphics turns broad; reduce it, graphics gets narrowed.

Offset dist Y: The Y-direction offset of the graph in “Preview”. The default value is 0. Increase it, graphics moves up; reduce it, graphics moves down. Left-side bearing: As the figure 5-11, namely the distance of the left frame of gray box and the left frame of blue box.

Right-side bearing: As the figure 5-11 shows, namely the distance of the right frame of gray box and the right frame of blue box. In Figure 5-11, we can see "update font file" and "Char kerning" two functional buttons are disabled. Here we need to choose name of jsf font library, the

functional button is  behind the input box.  Function keys : the function keys pop "open" dialogue ->Select the name of font library we need to amend ->Clicking “OK” (there will indicate the route of file).As follow figure 5-12.

Now, "update font file" and "Char kerning" two functional buttons are in valid state.

“Update font file”: Click this button-> "Character Attributes" dialogue as the figure 5-13.

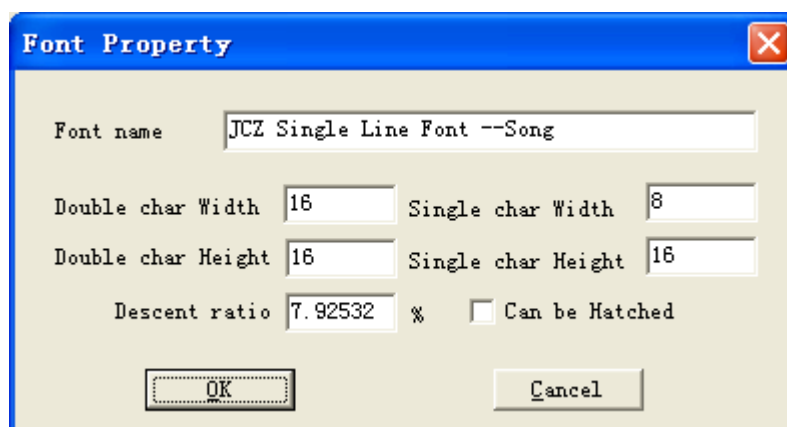


Figure 5-13 font property

Font name: The name of character which Font library file saved.

Double char Width / Height: Such as double byte characters like Chinese, the width and height of the character they correspond.

Single char Width / Height: Such as single byte characters like English and digit, the width and height of the character they correspond.

Descent ratio: The percentage of height hereinafter the baseline accounting for the character's standard height.

Can be hatched: Check it, means allow hatch the characters, or else, not allowed.

Char kerning: Click this button->"Char kerning" dialogue, as the figure 5-14.

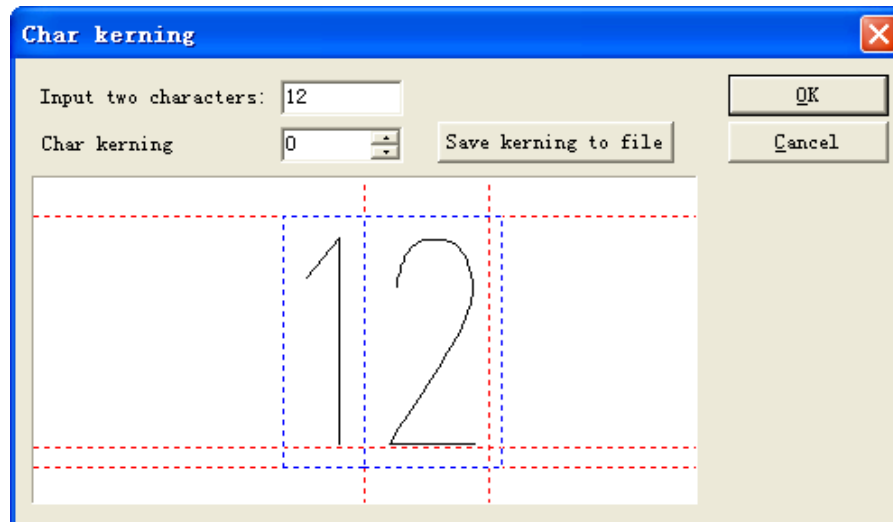


Figure 5-14 char kerning

Input two characters: The two characters which need to adjust the space.

Char kerning: The space between the two characters that need to be adjusted, up arrow stands for increment, down arrow stands for convergence. Also can input digital directly.

Save kerning to file: Save the space to the Character style file.

5.7.2 Instruction for steps of establishing font library

Let's take an example to show how to use the function of JSF character library.

Ex1 : Establish a font library named ezcad0521, and add character "a" to it.

Use the software to edit 'a' that we need to represent or import one and make graphics in selected state, as figure 5-15 shows.

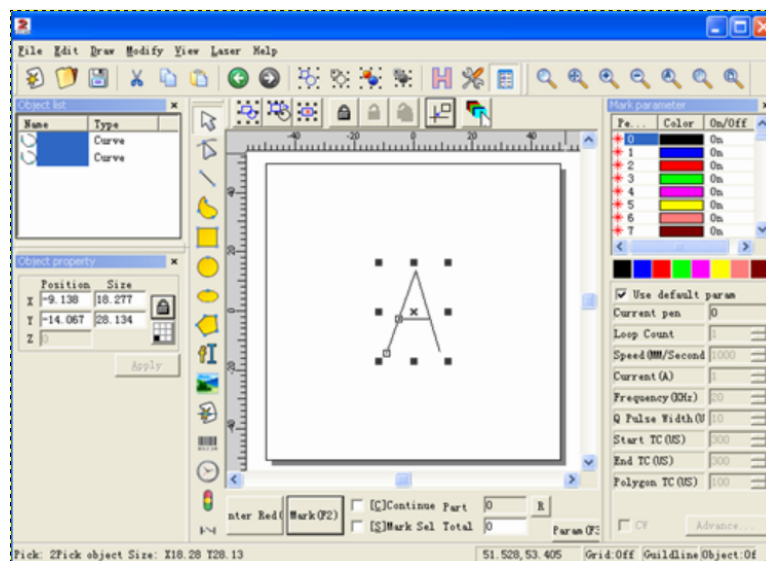


Figure 5-15 draw the graph

Click "Modify" "JSF Fonts", then shown a font dialogue box as figure 5-17. Click button , and find SIC- LASER PC\font catalogue in the dialogue, input "EZCAD0521", and then click the button to indicate dialogue as the follow figure 5-15 .

Please note: the route of system fonts is SIC- LASER PC\font, so you must create in the folder a new name of the file, otherwise the software will not fetch the file retrieval. Now the system will find a file named "EZCAD0521" font in route: SIC- LASER PC\font, if not found, the system will lead a dialogue to remind users whether establish the document or not. Click "ok" to establish EZCAD0521.jsf document, then shown a dialogue "Character Attributes" as figure 5-18, after amending the attributes, such as the height of double->character and single character, the width of double -> character and single character, descent height hatch etc (Normally defaulting) ->click 'OK', then the system have saved the document named "EZCAD0521, jsf" already.

Input character "a" into the corresponding character editing box, then amend the characters ratio, offset distance and stay width is parametric to make the graphic to the suitable position->Click the button: 'Save character data'. Now the pattern data has been saved to the position where character 'a' corresponded. As figure 5-15 shows.

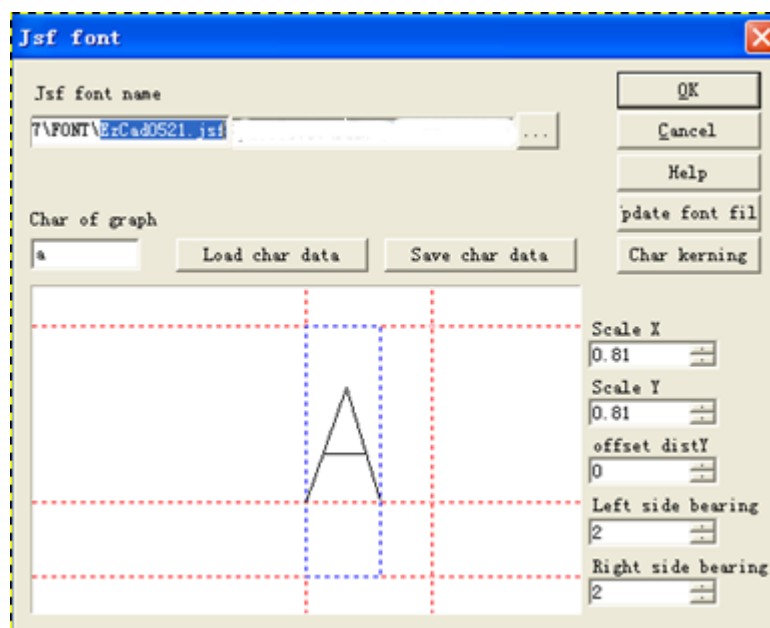


Figure 5-16 save

Quit from JSF fonts dialogue- Restart the software. Establish a text object-Select "JSF font" in the font list of Text attributes column-Select our new EZCAD0521 font-Input 'a' in the text box-Click "Apply". Then it could be edited out the graphics of characters 'a' we required

Ex2: Amend the character A in the file "EZCAD521", then amend the character structure of whole font library.

1. Click "JSF fonts" under "modify" menu, then shown the JSF font dialogue, as the figure

5-17->Click , open the dialogue to find the route: SIC- LASER PC\font->Input "EZCAD0521"--> Click the button.

2. Input 'a' in the input field which the graphic corresponded, Click 'Load char data' button, then appeared in the preview box a graphic which is representative A. By amending the X Y scale, offset distance and bearing to achieve the effect result we need. Then Click "Save Char Data" button.

3. Click "Update font file" button, and shown a dialogue as figure 5-24. Here we can amend the name of font, the height and width of double-character and single character, descent ratio, hatch or not, etc.

4. Click 'OK'->quit from JSF font dialogue->Establish a text object->Select "Single font" in the list of 'Text attribute'-> Establish the font entitled

"EZCAD0521"->Input 'a' in the text input.->Click "Application". Then we can edit out the amended character 'a' graphic.

Chapter 6 View Menu

The View Menu is used to set every option for view in the SIC- LASER PC window, as Figure 6-1 shows.



Figure 6-1 View Menu

6.1 Zoom

The Toolbar of the zoom Menu is



 : Zoom in or out in a selected area. If pressing the right button of the mouse, the current view will zoom out for one time with the mouse pointer's position as the center; and if pressing the left button of the mouse, the current view will zoom in for one time with the mouse pointer's position as the center.

 : Move the current view

 : Zoom in

 : Zoom out

 : Fill the whole view area with all the objects

 : Fill the whole view area with only the selected objects

 : Fill the whole view area with the whole workspace

6.2 Ruler / Gridding / Guide Line

There are Horizontal ruler, Vertical ruler, Gridding and Guide Line for selection.

6.3 Snap Grid

Automatically put the dots drawn on the grid.

6.4 Snap Guide Line

This item is used to make objects approach to guide lines automatically when moving the object.

6.5 System Toolbar / View Toolbar / Draw Toolbar / Status Bar / Object List Toolbar / Object Properties Toolbar/ Mark Parameter Toolbar

Toolbars can be either displayed or hidden by selecting corresponding options in View Menu. The Status Bar can be displayed or hidden, either. When there is a “√” selected in front of the submenu, the corresponding toolbars or Status Bars are visible, and if not, they are hidden.

Chapter 7 Special

7.1 Change text

When selected, a dialog box will appear(Figure 7-1).

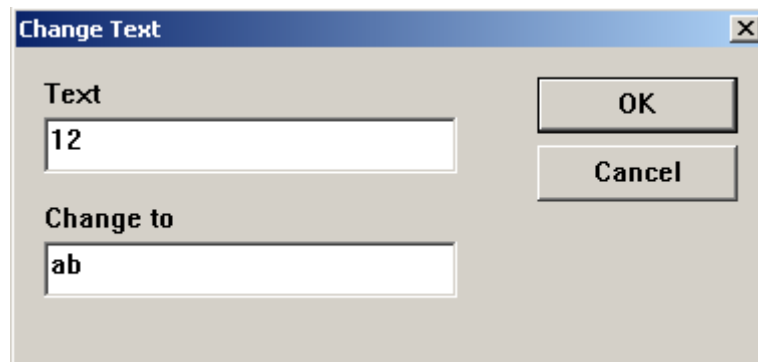


Fig 7-1 change text interface

The content under 'text' has to be replaced. The content under 'change to' is by what it is replaced. Figure 7-2b is the result after apply the modification on figure 7-2a as the method in figure 7-1.

12 → ab

1234

Fig 7-2a content before replace

1234

Fig 7-2b content after replace

The name of the text is replaced, but the content of the text is not changed.

Chapter 8 Marking

8.1 Pen List

In SIC- LASER PC, every document file has 256 pens, and they are located in the top of the Mark Parameter's Table. Each pen has a group of marking parameters

: Objects with selected pen's number will be marked. Users may customize the color by double-clicking the color sticker.

: Objects with selected pen's number will not be marked.

Color: the pen's color on the workspace

When pressed the button, the pen number of the current object will be changed to the one that the color stands for.

When pressing the right button of the mouse, a shortcut menu will appear as Figure 8-2 shows.

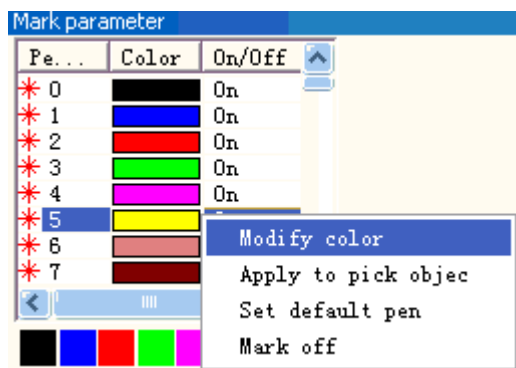


Figure 8-2 Shortcut Menu

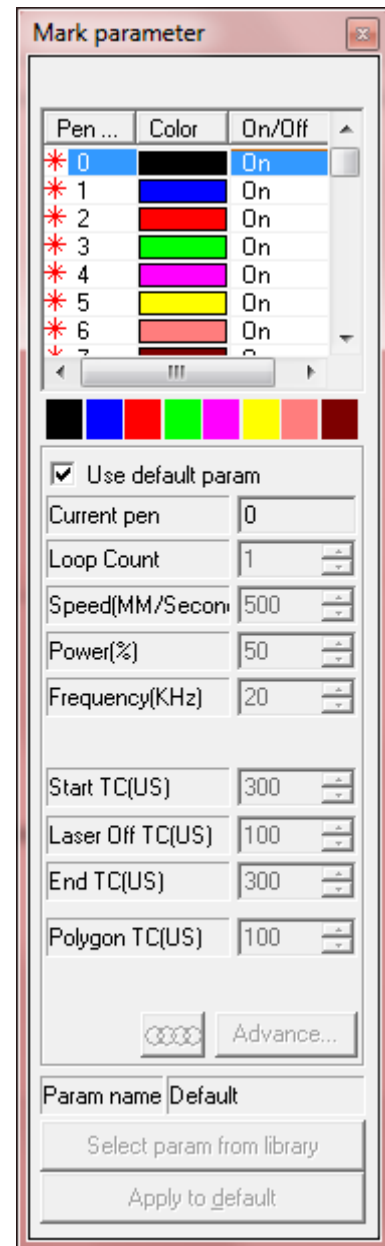


Figure 8-1 Marking Properties Table

Loop count: number of time to mark objects with the selected pen

Speed: the current marking speed

Power: Indicate the power percentage of the current marking parameter, and 100% refers to the biggest power of the laser equipment.

Frequency: the laser machine's frequency in the marking parameter

Start TC: When the galvanometric head has to execute a marking command, the scanner mirrors first have to be accelerated up to the defined marking speed. In the beginning of the movement, the laser focus moves very slowly which may result to burn-in effect at the start point. To avoid this, We insert a delay (**Start TC**) at the beginning of each mark command. When the laser turns on, the mirrors have already reached a certain velocity. However, if this value is too large, the first part of the vector will be cut off. Negative value is supported.

Laser Off TC: The time after the marking is done when the laser shut down. Proper time can wipe off the burn-in effect at the end. This value cannot be negative.

End TC: The End TC parameter is used to control how long the software will wait at the end of a series of vectors. The wait is required because the software is always "ahead" of the hardware and must wait for the hardware to catch up. This delay applies to the end of all vectors in which the laser is to be turned off after execution.

Polygon TC: The Polygon TC parameter is used to control how long time the software will wait at vector connection points. This wait is required due to the lag time between the software/DAC position and the actual hardware/mirror position. This timer applies to all vectors whose endpoint is also the start point of the next vector (polygon connection points). In other words, this timer applies to end of all vectors in a series of connected vectors, except for the last one (the end of last one is controlled by the **End TC** parameter). The three connected points in a square or the intermediate connection points in a polyline circle are examples of points the **Polygon TC** parameter can effect. The starting point of the square is controlled by **Start TC** parameter. The last corner of the square is controlled with the **End TC** timer.

8.2 Advanced Parameter

Clicking “Advanced” will prompt an advanced parameter dialog box as Figure 8-3 shows.

The 'Advance mark param' dialog box contains the following parameters:

- Jump Speed: 4000 MM/Sec
- Jump Position TC: 250 US
- Jump Dist TC: 1 US
- End compensate: 0 MM
- Acc. Distance: 0 MM
- Point time: 0.100 ms
- Wobble: ☐
- Diameter: 1.000 MM
- Distance: 0.500 MM
- End Add Points: ☐
- Count: 1
- Distance: 0.010 MM
- Point time: 1.000 ms
- Point Cycles: 1
- Vector point mode: ☐
- Pulse per point: 1
- Yag Optimize mode: ☐

Buttons: OK, Cancel

Figure 8-3 Advance mark parameter

Jump Speed: set a jump speed of the scanner for the current parameter

Jump Position TC | Jump Dist TC: After each jump movement, the system will delay some time then execute the next command. The actual delay time is calculated by the following formula:

Total delay = (Jump Distance * Jump Dist TC) + Jump Position TC

End compensate: In high-speed operation, this parameter need not to be set. It is used to mark a little bit more as an ending increment at the end of an operation. Negative value is supported.

Acc Distance: In those applications that require laser marking without variation of intensity, we have to add an accelerated segment before the start point to reach the homogenous marking results.

Point Time: This parameter is used to set the marking time if there are dot objects.

Vector point mode/Pulse per point: Marking the vector graph using point mode, and force the pulse number while marking each point

Now let's take it into practice:

Mark a rectangle with size 40×20 and fill it with the following parameters: **Mark Contour/ Edge offset=0 / Line Distance =1.0 /Hatch Angle= 0 / Unidirectional hatch**

Set the marking parameters like this:

- Loop count: 1
 - Marking Speed: XX
 - Jump Speed: (It is suggested to use 1200 –2500.)
 - Power Percentage: 50%
 - Frequency: 5KHZ
 - Start TC: 300
 - End TC: 300
 - Polygon TC: 100
 - Jump Position TC: 1000
 - Jump Distance TC: 1000
 - End compensate: 0
 - Acc. Distance: 0
- Adjust **Start TC**

There may be several results to mark this hatched rectangle.

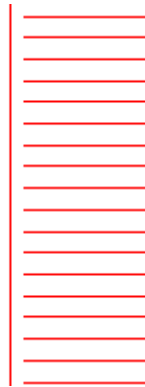


Figure 8-4 Case #1

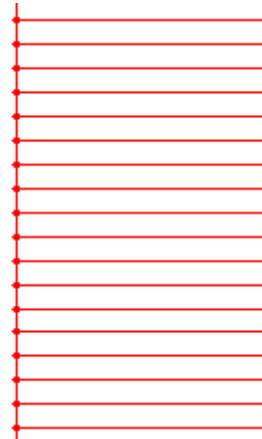


Figure 8-5 Case #2

- o Case #1: The hatch-lines and the border are separated. (Figure 8-4) This is because the **Start TC** Value is too big and it needs to be smaller.
- o Case #2: The hatch-lines and the border are intersected (burn-in effect). (Figure 8-5) This is because the **Start TC** Value is too small and it needs to be higher.
- o Case #3: Uniform result. (Figure 8-6)

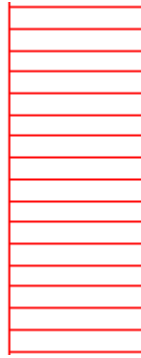


Figure 8-6 Case #3

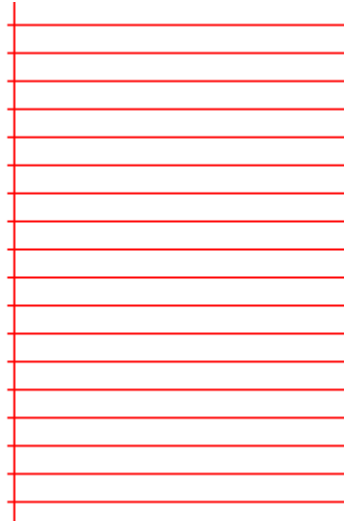


Figure 8-7 Case #4

Sometimes when however users modify the **Start TC**, the hatch-lines and the border cannot be superposed. Here users need to set the **Acc Distance** Parameter (Values from 0.05 to 0.25). But this may cause the 4th case: the hatch-lines are beyond the border, as Figure 8-7 shows. Users may increase the **Start TC** Value or lower the **Acc Distance** Parameter, and if the two parameters are adjusted well, there will be a perfect result.

- Adjust **End TC**:

Still mark the hatched rectangle mentioned above

Here are three possible cases about the hatch-lines and the border's relative positions.

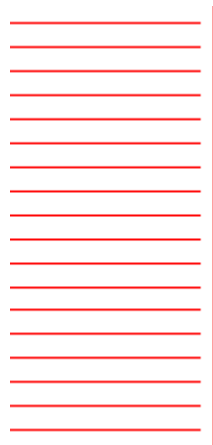


Figure 8-8 Case #1



Figure 8-9 Case #2

- o Case #1: The fill-lines and the border are separated, as Figure 8-8 shows. This is because the **End TC** is too short and users need to raise it.
- o Case #2: Burn-in effect as Figure 8-9 shows. This is because the **End TC** is too long and users need to shorten it.
- o Case #3: Perfect result as Figure 8-10 shows.



Figure 8-10 Case 3



Figure 8-11 Case 4

Sometimes when however users modify the **End TC**, the hatch-lines and the border cannot be superposed. Here users need to set the **End Compensate** (Values from 0.05 to 0.25). But this may cause the 4th case: the hatch-lines are beyond the border, as Figure 8-11 shows. Users should lower the **End Compensate** to reach the perfect result.

- Adjust **Jump Position TC** | **Jump Dist TC** :

Below is the adjust steps:

Set the two Jump TC items' values (Position TC value and Distance TC value) as 0 and then mark the rectangle.

If the start and ending segments of the hatch-line are bent, users need to increase the two Jump TC's values until there is no bend appearing.

Note: A Jump TC too big may influence marking efficiency. The lower the two Jump TC's values are, the better the performance of the scanner is.

- Adjust **Polygon TC**:

If mark a rectangle with size 40×20, you may found three possible results about the rectangle's corners:

.

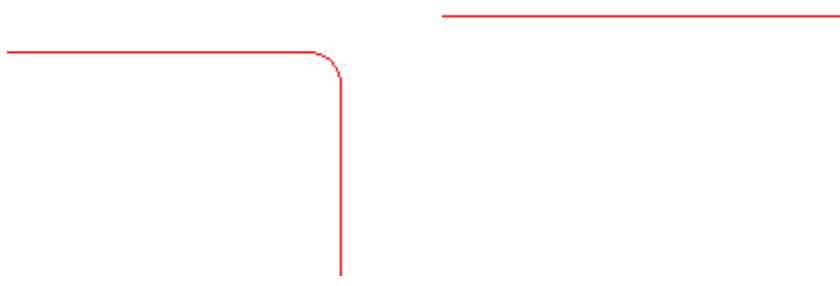


Figure 8-12 Case #1

Figure 8-13 Case #2

- o Case #1: As Figure 8-12 shows, the angle is curved. This is because the **Polygon TC** is too short, users need to raise the value
- o Case #2: Burn-in effect as Figure 8-13 shows. This is because the Polygon TC is too long; users need to shorten the value.
- o Case #3: Result expected



Figure 8-14 Case #3

When finish setting these parameters, you may start to mark. It is recommended that users had better not modify the parameters which have been adjusted well. If they were changed, the result would be changed too.

Users can use the same way to set other parameters and save them in the parameter list. By doing this, users can reduce the repeated works and raise the work efficiency.

8.3 Marking Parameter Library

When unselect ☒ Use default param, users can select pen's parameters from the library.

Select param from library: When press this button; a dialog box will appear (figure 8.3). Users can save the parameters to disk files, or delete them.

Save current param as: "Save current param as" is used to name the current marking parameter to disk as another parameter base's name.

Delete: Delete the current parameter base name.

Apply to Default: Save all the current parameter to "default" parameter base name

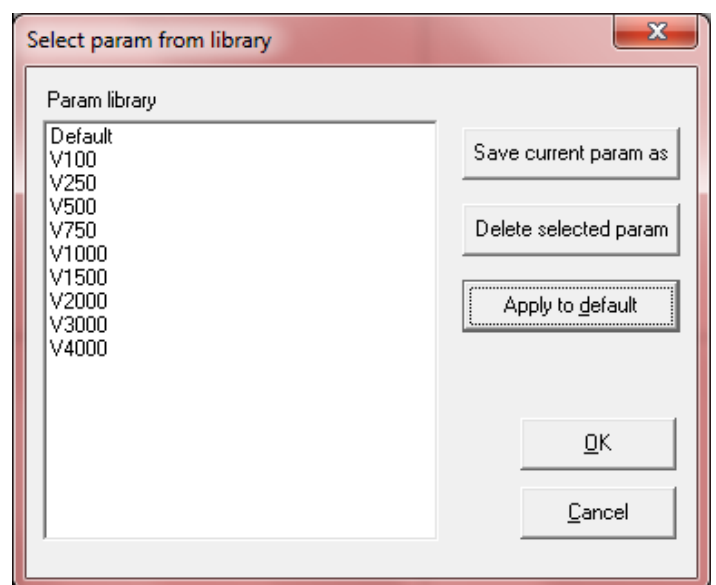


Figure 8-15 Marking Parameter Base List

NOTE: SIC LASER PC has already parameters saved in the library. We strongly recommend you to use these parameters as starters. In this way, you would avoid all the Start TC, Laser Off TC, End TC and polygon TC settings.

8.4 Mark-Control Bar

The Mark-Control Bar is located at the bottom of the main interface window, as Figure 8-16 shows.

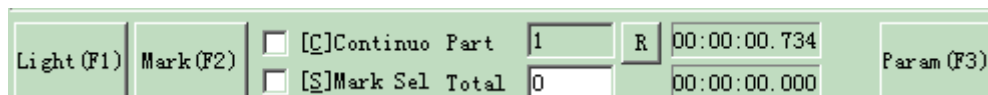


Figure 8-16 Mark-Control Bar

Light: Display a red guide corresponding to the frame of the marking. Helpful to place the piece
Key “F1” is the shortcut key of this function for guide light show.

Mark: Execute marking
Key “F2” is the shortcut key of this function.

Continuous: Mark the objects continuously until user stops the marking

Mark Selected: only those selected objects would be marked

Part: Total number of marking realized

Total: The total counts that the mark command should be executed. The value would decrease 1 automatically after the mark command has been executed each time. It is unavailable under the mode of Continuous Marking. When in marking process, if the amount number is more than 1, the marking operation will not stop until the marking number is 0.

Parameter: Machine parameter
Key “F3” is the shortcut key of this function.

8.4 Machine Parameters

8.4.1 Field Parameter

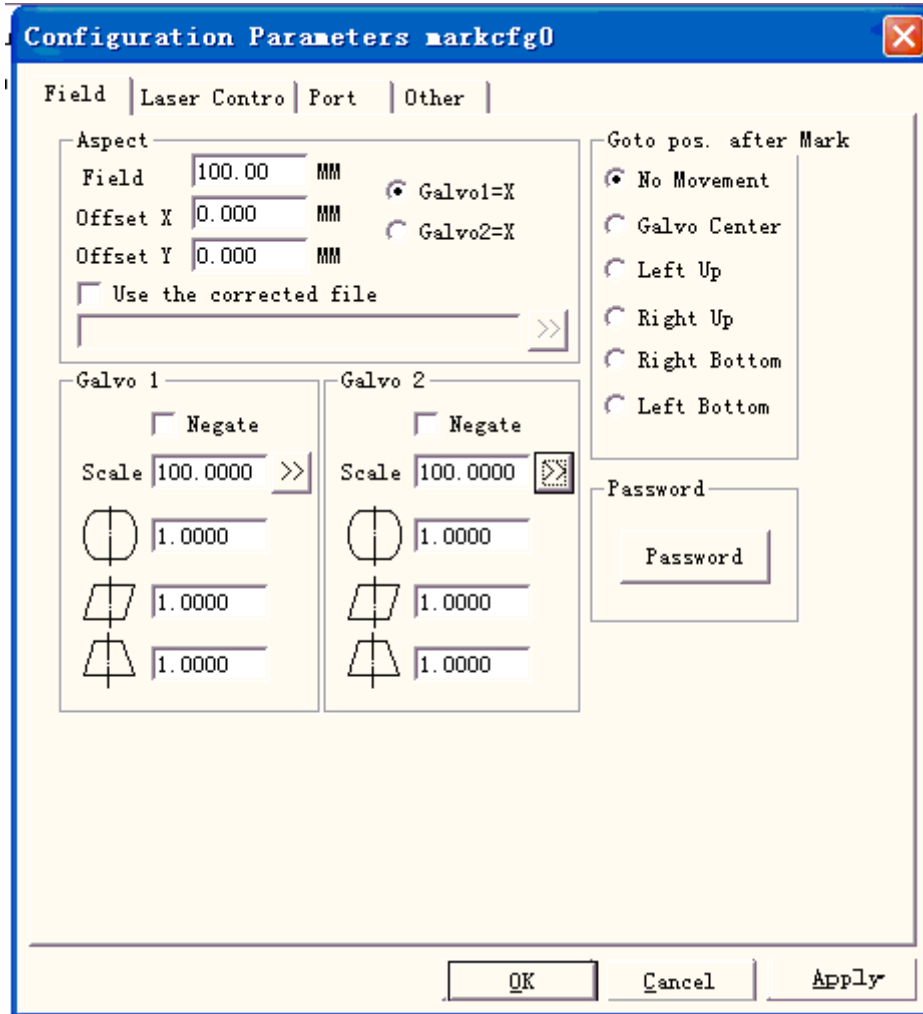


Figure 8-17 Area Parameter

Field: the maximum size of the marking

Galvo 1=x: the track of galvo 1 used as the X axis

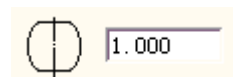
Galvo 2=x: the track of galvo 2 used as the X axis

Offset X: The offset distance on X direction of the galvanometric head.

Offset Y: The offset distance on Y direction of the galvanometric head.

Use the corrected file: Use the correction file appropriated to the lens.

Negate: Invert the current galvo direction



This item refers to the distortional correction coefficient. The default value is 1.0 (range from 0.875 – 1.125). If your design is as Figure 8-18 shows but the result of the marking is Figure 8-19 or Figure 8-20, you will have to increase the coefficient on the X axis direction for Figure 8-19 and lower the coefficient on the X axis direction for Figure 8-20.

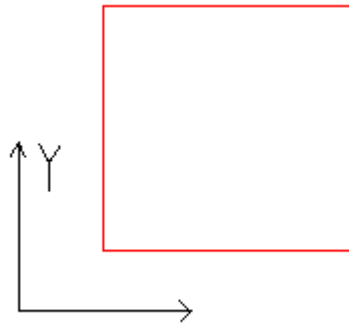


Figure 8-18 Workspace Design

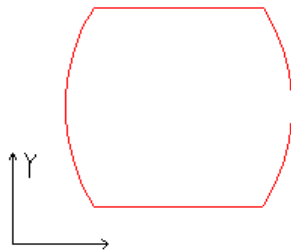


Figure 8-19 Marking result

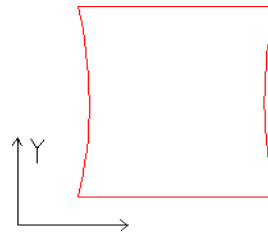


Figure 8-20 Marking result



This item indicates the parallelogram correction coefficient. The default value is 1.0 (range from 0.875 – 1.125). If your design is as Figure 8-18 shows but the marking result is Figure 8-21, you will have to adjust this parameter to correct it.

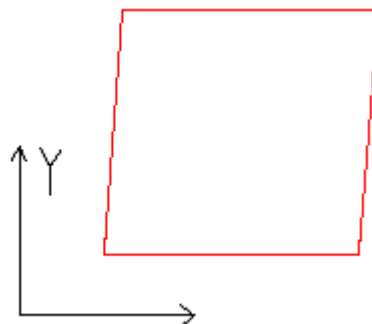


Figure 8-22 Marking result

Scale: It refers to the flex percentage, and the default is 100%. This parameter will be adjusted when the size of the marking is different from the setting size. If it is smaller than the designed one, users should raise this parameter; if it is bigger than the designed one, users should lower this parameter.

When setting scale, we may press the button , and a dialog will pop up just like figure 8-23.

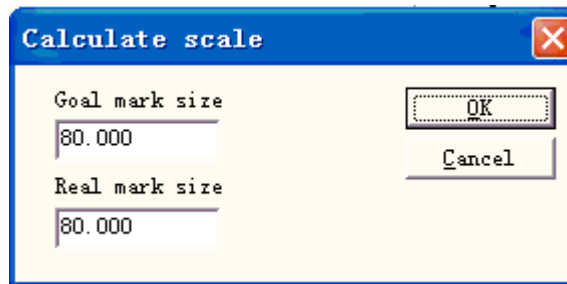


Figure 8-23 Set the scale

Goal mark size: the size set in the software.

Real mark size: the measured size of the object that have been marked on the piece.
The software will calculate the scale automatically according to these two values.

After mark go to: The gavlo jump to the appointed position when finishing marking

Password: after set the password ,we must input it can enter the Param Dialog Box.

8.4.2 Laser Control Parameter

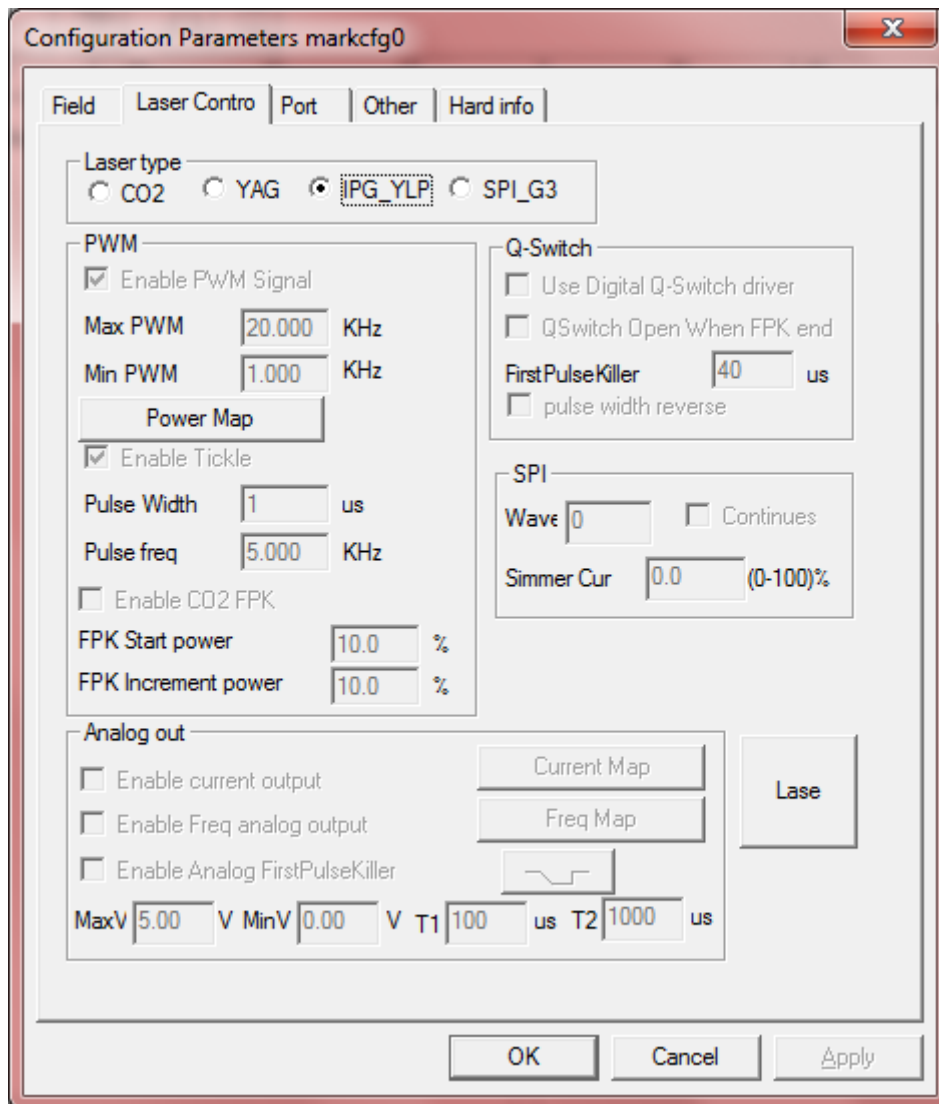


Figure 8-24 Laser Parameter

Laser type:

Co2: It indicates that current laser type is Co2 laser.

YAG: It indicates current laser type is YAG laser.

IPG: It indicates that current laser type is IPG _YLP laser

SPI_G3: It indicates that current laser type is SPI laser.

Note: this function only support USBLMC control card.

PWM:

Enable PWM signals: The PWM signal will be output from Control Card

Max. PWM freq: the max frequency of the PWM signals

Enable Tickle: Let the preionization signals active for some CO2 laser sources.

Pulse Width: the pulse width of the preionization signals

Pulse Period: the frequency of the preionization signals

Use Digital Q-switch driver: This function is for digital Q-switch. If check this function, the output port 1 and 2 cannot apply in other purpose. This mode mainly design for Digital Q driver of Guilin Xingchen

Q-switch Open when F.P.K End: If Checked, the Q-switch modulation signal will begin pulsing after the FPS delay has expired. Otherwise Q-switch pulsing begins at the end of the Start TC delay and coincidentally with the beginning of the FPK signal.

First Pulse Killer (F.P.K): the lasting time for the first pulse suppression

Pulse width reverse: Reverse the PWM signal. See figure 8-25

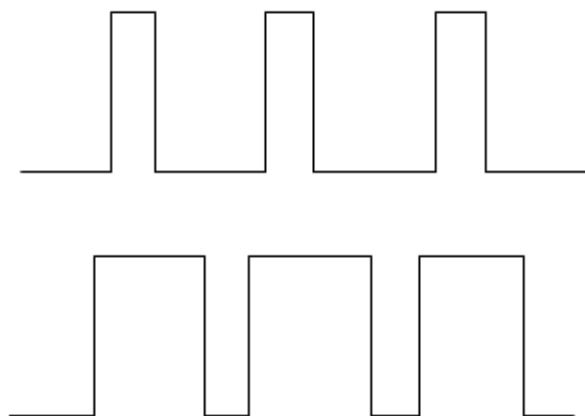


Figure 8-25 pulse width reverse

Enable Power Analog Output: Enable the control card to output analog signal which used to control laser power.

Power Mapping: This is power emendation function, used to set the power percentages of the customized and the corresponding one, as Figure 8-26 shows. If the customized power percentage is not in the displays of the Power dialog box, the system will pick the linearity margin values.

Enable Frequency Analog Output: Enable the control card to output analog signal which used to control Q-Switch frequency

Frequency Mapping: This is frequency emendation function, used to set the frequency percentages of the customized and the corresponding one, as Figure 8-27 shows.

Enable CO2 FPK: can wipe off the burn-in effect at the start.

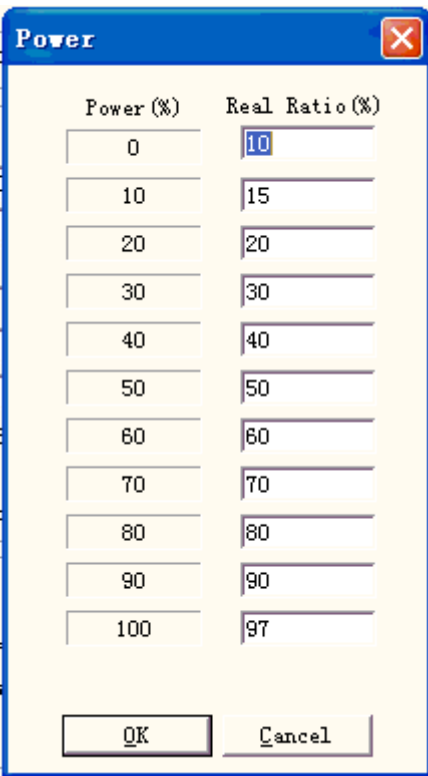


Figure 8-26 Power Map Dialog Box

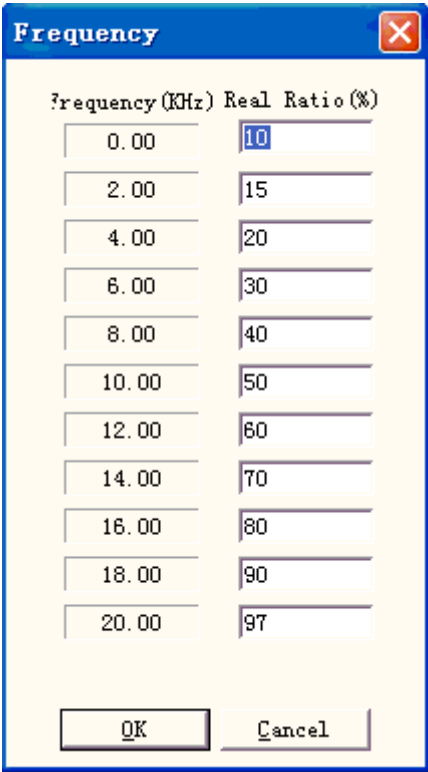


Figure 8-27 Frequency Map Dialog Box

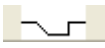
Enable Analog First Pulse Killer:

Max: Max voltage of analog FPK.

Min: Min voltage of analog FPK.

T1: Time that the FPK signal changes from Max voltage to Min voltage, or reverse.

T2: If the time gap between the laser off and laser on is less than T2, the FPK would not output.

: The direction that the FPK changes.

About the T1 and T2 we can see figure 8-28:

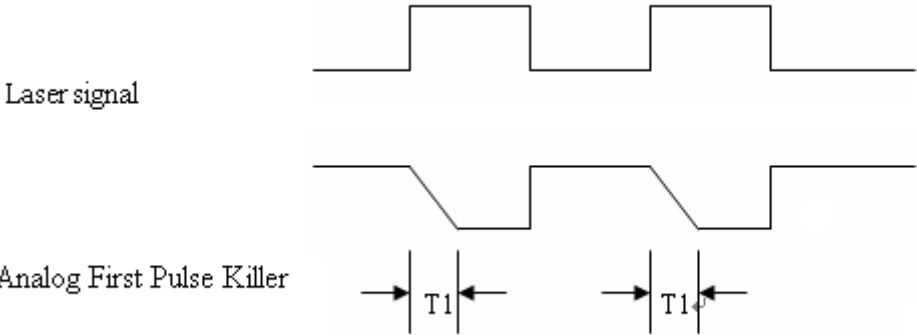


Figure 8-28

Test laser

It is used to test if laser is working normally or not. Hit “test laser” button presenting dialog box shown in graph 8-29:

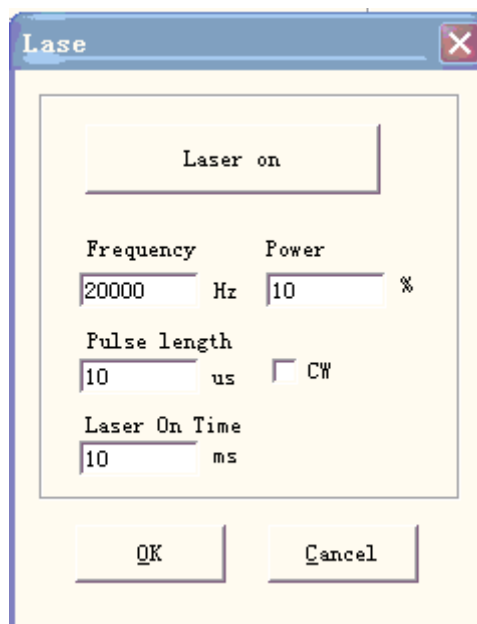


Figure 8-29 Test laser dialog box

Fill in the frequency, power, pulse width and laser on time and hit “Laser on”. After that LASER open and it will close when reach the appointed time.

8.4.3 Port parameter

Equipment port parameter is shown in figure 8-30:

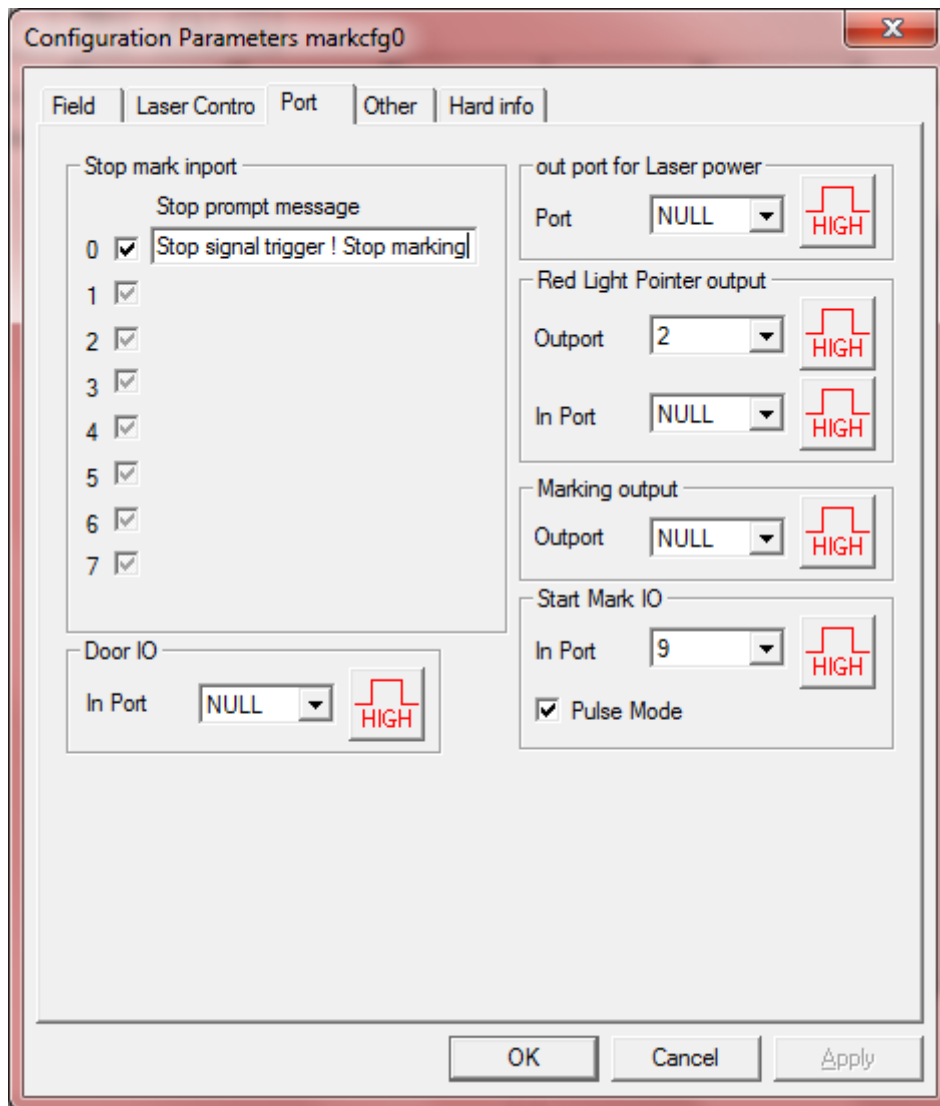
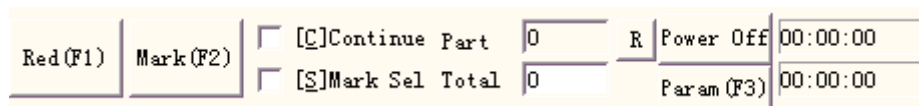


Figure8-30 Port Parameter Dialog Box

Stop Marking Input Port: When in marking process, if the system detects there is a corresponding input signal, the current marking operation will be ended, and prompt users with error information.

Out port for Laser power: The port can be used to control the laser power supply. If you set this port, there is a 'Power off' button displayed on the marking bar, see the figure



Red light pointer I/O: The system will output High-level to the appointed output port when guide light show.

Marking IO: The appointed port will output high level voltage (TTL Compatible) while in marking.

Start Mark IO: In idle state, the software will start mark if detect the high level voltage from the appointed port

Pulse Mode: Checking this option means the soft receive the start signal as pulse mode,

otherwise it is as level mode.

8.4.4 Other

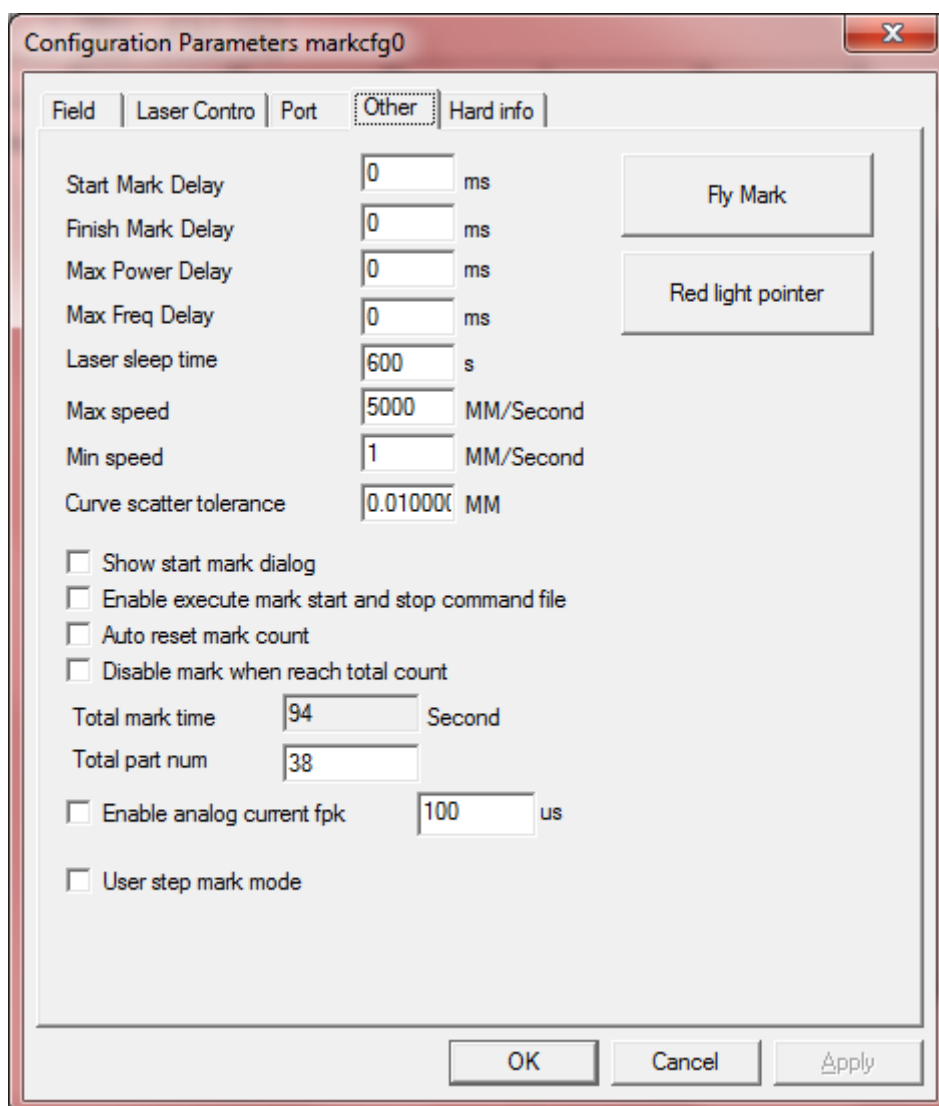


Figure 8-31 Other Parameter Dialog Box

Starting Mark Delay: The delay before marking.

Finish Mark Delay: The delay after marking

Max. Power Delay: The Max delay when the laser power is changed from 0% to 100% during marking. When the power's range is changed less than 100% during marking, the time is less proportional to the Max value. This function is suitable for the laser power supply with slow response speed. If the laser power supply's response speed is very quick, this value may be 0 ms.

Max. Freq Delay: Same as max power delay

Show start mark dialog: Every time inquired whether mark it before the marking

Enable execute mark start and stop command file: When the mark started and finishes needs to execute a command file first.

After enabling this function, when the marking starts, the system will seek for the start.bat document under the current software of contents automatically and executes it; After the marking had ended the system will seek for the stop.bat document under the current software of contents automatically and executes it.

The bat document format is simple, it can use the textual edit software (for example: The notepad, tablet and so on the other software) to direct compilation. Bat is the pure ASCII code text document, altogether has 3 orders.

1. The examination input port orders IN, for example IN2=1 expression system examination input port 2, if IN2 is the high level downward carries out, otherwise has waited for that IN2 turns high.
2. The establishment output port orders OUT, for example OUT4=1, the expression system establishment output port 4 is the high levels.
3. The time delay orders DELAY, for example DELAY=1000, expression system time delay 1000 milliseconds.

Auto reset mark count: after the mark stop, the software reset mark count automatic

Disable mark when reach total count: set the total count, when the amount reached, the software will not continue mark.

User step mark mode: When the marking according to the establishment the Galvo smallest distance movement, delay fixed time after each movement distance, this function mainly uses in the strong laser power hitting the depth, the step delay is bigger, the laser marks in the pause position deeply.

Red Light Pointer:

Max. Freq Delay: Same as max power delay

Red Light Pointer: Refers to guide light

Light Speed: the speed of guide light

Offset Pos X and Y: it is used to compensate the position error between guide light and the laser beam.

Enable continue mark mode: enable this function, return the software surface, click “Param” then the dialog box popup shown as following Figure, it will be appear after mark stop every time, the Red Laser Pointing always exist.

